

NEWS
BULLETIN

समाचार
पत्रिका



NEPAL GEOLOGICAL SOCIETY

नेपाल भौगर्भिक समाज

(स्थापना वि.सं. २०३७, सन् १९८०)

Volume 13

February 1996

Falgun 2052

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KATHMANDU
NEPAL

NEPAL GEOLOGICAL SOCIETY
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1994 - 96

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Editorial

The Nepal Geological Society is pleased to bring out this volume of News Bulletin on the auspicious occasion of silver jubilee of accession of throne by His Majesty King Birendra Bir Bikram Shah Dev of Nepal. The Nepal Geological Society tenders its warm respect and wishes a long and happy life to His Majesty the King.

The Society had successfully organized the First Nepal Geological Congress (NGC-I) in Kathmandu from 15 to 16 August 1995. The then Honorable Finance Minister Mr. Bharat Mohan Adhikari was kind enough to be the Chief Guest. In his inaugural address, he congratulated to the Society and its members for being the first professional geoscientific society to organize such a Congress in Nepal. In this Congress in together with Nepalese participants, geo-scientists from Australia, Europe, Japan, SAARC Countries and U.S.A. also presented their research papers and scientific findings on Himalayas. Abstracts of all the papers were published by the Society in the Journal of Nepal Geological Society, Vol. 12, Special Issue in 1995. Plans are under way to publish the Proceedings of First Nepal Geological Congress in a separate volume of Journal of Nepal Geological Society.

The Nepal Geological Society in collaboration with Home Ministry, HMG/N has been commemorating IDNDR Day since 1991. This year also, on Wednesday, October 11, 1995, the Society organized a day long National Meeting cum Seminar in which Honorable Home Minister Mr. Khum Bahadur Khadka was the Chief Guest. Honorable Minister appreciated the efforts of the Nepal Geological Society for making government and the people aware of natural disasters in Nepal and suggesting the ways and means for its reduction. He has also suggested that the Nepal Geological Society should work as an initiator of such program. The Meeting cum Seminar was attended by the representatives from various Governmental Organizations, NGOs, Educational Institutions, Red Cross Society, Municipality and Foreign Missions.

In this volume of News Bulletin, the Society has been able to publish abstracts of all papers presented on IDNDR Day 1995 and also an article on 'Natural Hazards and their Management'.

We trust as usual this volume will be useful to our readers. Even though it is late, we wish happy and prosperous New Year 1996 to all our members, their families and readers. The Society would also like to extend sincere thanks to those who have made professional and financial contribution in the publication of this issue.

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NGS News

1. First Nepal Geological Congress (NGC-I) was successfully organized by the Nepal Geological Society on August 15-16, 1995 on the auspicious occasion of the 15th anniversary of the Society. The Congress was held at the Nepal Administrative Staff College (NASC), Jawalakhel, Lalitpur. About 200 geoscientists and engineers from different countries of Europe, SAARC region, Australia, Japan and U.S.A. participated in the Congress. More than half of the total participants were from Nepal itself. First Nepal Geological Congress (NGC-I) was organized with an opinion that regular undertaking of such events will provide a platform for scientists interested or working in Himalayan region, for effective communication as well as sharing of knowledge and experiences among themselves.

During the opening session on August 15, 1995 morning, welcome speech was delivered by Mr. K.P. Kaphle, Convenor of the Congress. The then Honourable Minister of Finance, Mr. Bharat Mohan Adhikari inaugurated the Congress by lighting a traditional oil lamp and delivering the inaugural speech. The opening session was chaired by Honorary Member of the Nepal Geological Society Dr. C.K. Sharma. Secretary of the Nepal Geological Society Dr. Rajendra B. Shrestha delivered the vote of thanks. For the verbal presentation of papers during the two days gathering, mainly five themes were defined besides Key Note Addresses. They were: 1) Regional Geology and Tectonics 2) Hydrogeology 3) Geo-Environment 4) Geo-Science and Infrastructure 5) Mineral Resources.

The Congress ended with a concluding session which was chaired by Mr. N.B. Kayastha. During the concluding session, one delegate each from Bangladesh, India, Japan and Pakistan was invited to share their feelings about the First Nepal Geological Congress. Chairman of the concluding session, Mr. N.B. Kayastha delivered the

concluding remarks. At the end of the concluding session, Mr. K.P. Kaphle, President and Dr. Dibya R. Kansakar, Vice-President of the Nepal Geological Society thanked all the participants from various countries for their participation in the Congress and making it a very successful event and bid farewell to them.

2. The 16th Annual General Body Meeting of the Nepal Geological Society was held on September 15, 1995 (Bhadra 30, 2052) at the auditorium of the Department of Mines and Geology, Lainchour, Kathmandu. The meeting began with the deliberation of annual report by the Secretary of the Society Dr. Rajendra B. Shrestha to the General Body which was followed by the presentation of financial report by the Treasurer of the Society Mr. Babu Raja Aryal. Members of the Society participated in broad range of discussions on various topics and issues related to the further development of the Society.
3. The Nepal Geological Society organized a one-day National Meeting cum Seminar on "Prevention of Natural Disaster: Challenges to Scientific Communities in Nepal" on October 11, 1995 in co-operation with the Water Induced Disaster Prevention Technical Center (DPTC), Kathmandu and Home Ministry, His Majesty's Government of Nepal to commemorate the International Decade for Natural Disaster Reduction (IDNDR) Day, 1995.
4. SCIENTIFIC WRITING WORKSHOP was organized by the Nepal Geological Society during September 17-19, 1995 at the Seminar Hall, Samajik Sewa Parishad, Lainchour, Kathmandu. Prof. P. G. Cooray from Sri Lanka who had conducted such workshops for researchers, academicians, technical professionals, administrators etc. in different parts of South Asia and South-East Asia kindly accepted the invitation of the Nepal Geological Society and successfully conducted the workshop here in Kathmandu.

The workshop was participated by 45 scientists and engineers from various governmental and non-governmental organizations. The workshop was partially sponsored by AGID, IUGS and COGEOED.

5. The Nepal Geological Society organized a talk program at the auditorium of the Department of Mines and Geology,

Lainchour, Kathmandu on July 13, 1995 (Asadh 29, 2052). The scientific talk was delivered by Prof. Muhammad Qasim Jan, Director, National Center of Excellence in Geology, University of Peshawar, Pakistan on "Petrological Evolution of Kohistan Magmatic Arc in the Himalaya of Pakistan".

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नेपाल भौगर्भिक समाजको सोडौँ बार्षिक साधारण सभा सेप्टेम्बर १५, १९९५, काठमाडौँ, नेपाल

नेपाल भौगर्भिक समाजको सोडौँ बार्षिक साधारण सभा मिति भाद्र ३०, २०५२ (सेप्टेम्बर १५, १९९५) का दिन समाजका अध्यक्ष श्री कृष्ण प्रसाद काफ्लेको अध्यक्षतामा खानी तथा भू-गर्भ विभागको सभा कक्षमा सम्पन्न भयो । उक्त साधारण सभामा

समाजका सचिव डा. श्री राजेन्द्र बहादुर श्रेष्ठले प्रस्तुत गर्नु भएको बार्षिक प्रतिवेदन र समाजका कोषाध्यक्ष श्री बाबुराजा अर्यालले प्रस्तुत गर्नु भएको आयव्यय विवरण र तदुपश्चात सभामा भएको छलफल तल प्रस्तुत गरिएका छन् ।

Annual Report by Dr. Rajendra B. Shrestha, Secretary Nepal Geological Society

Mr. Chairman,
Dear Fellow Members of the Society,

It gives me a great pleasure to welcome you all to today's 16th Annual General Body Meeting of the Nepal Geological Society on behalf of the 8th Executive Committee and myself in person.

I am very much delighted being able to see you all this afternoon for this important meeting. It had already been one year since we took the office of the Executive Committee of the Nepal Geological Society. The Nepal Geological Society has made remarkable achievements in the past years in reaching its goals and fulfilling its objectives and had won praise both from international community of geoscientists and policy makers of the country. In keeping view of this, we have been putting our efforts to speed up the momentum gained so far by our Society. We are working to the extent possible in running daily activities of the Society as smoothly as possible. In this connection, the setting-up of different sub-committees are

continued in order to run various activities of the Society smoothly, to receive advice and cooperation from the members of the Society and to involve the members directly in various activities.

We had continued the tradition of biennial function of the Society by organizing a Biennial Dinner at Hotel Himalaya on August 26, 1994 in joint cooperation with the previous 7th Executive Committee.

Continuing the Society's regular contribution in the observance of the 1990's decade as the International Decade for Natural Disaster Reduction (IDNDR) by the United Nations, a day-long National Meeting cum Seminar was organised on October 5, 1994. During the end of the day long national meeting cum seminar, Resolution was also adopted by participants for the first time this year. The adopted Resolution of IDNDR National Meeting cum Seminar had already been presented to concerned or related

national organisations and international agencies including to the office of prime minister at Singhdurbar.

As far as publication of the Society is concerned, Proceeding of the 9th Himalaya-Karakorum-Tibet Workshop has been published as Journal of Nepal Geological Society, volume 11, Special Issue and reprints of articles from the proceeding had already been delivered to the corresponding authors. The publication of regular issue i.e. volume 11 of Journal of Nepal Geological Society and back issue of Vol.10 is on its way of publication. Also, abstract volume of First Nepal Geological Congress has been published as the Journal of Nepal Geological Society, Volume 12, Special Issue. Regular Issue of News Bulletin, volume 12 has also been published although with some delay, our sincere apology about that. With a view that developing relations with each other among the members of the Society become handy, we put an extra effort to publish the Nepal Geological Society Members Directory. This is one of our new attempt and there are still some mistakes in the directory. We sincerely hope that you will appreciate our attempt in this matter and also help us by correcting the mistakes so that it can be updated in future.

As per decision made by the General Body during the 15th Annual General Body Meeting, questionnaires regarding the amendment in the constitution of the Society as proposed by the Rules and Regulation Sub-Committee, had been circulated to all the members of the Society from 30th of October 1994 (B.S. 2051/7/13). Collection of Returned questionnaires with the opinion by the individual members of the Society had been submitted to Mr. Achyutananda Bhandary, co-ordinator, Rules

and Regulation Sub-Committee for the further work. We had hoped that draft of the amendment to be made will be available to today's General Body Meeting for discussion and necessary action. However, unfortunately due to illness incurred by Mr. Bhandary, it had not been possible to table the amendment at this time. The same responsibility has been handed over to Mr. Ramesh Kumar Aryal, who is working on it and we expect the results very soon. At this moment, I wish a speedy recovery to Mr. Bhandary and hope that we will be able to discuss and adopt necessary amendment in near future.

Well, we have to admit that we have not been able to make a real progress in acquiring the land for the Society. Our effort in this matter shall be continued in the time ahead.

During the past year, two scientific talk programs were organised with the co-operation of Scientific Sub-Committee. The first lecture was delivered by Mr. Raja Bhai Bajracharya on **Seismic Macrozonning of Nepal** on October 28, 1994 and the another one was given by Prof. Muhammad Qasim Jan, Director, National Center of Excellence in Geology, University of Peshawar, Pakistan on **Petrological Evolution of Kohistan Magmatic Arc in the Himalaya of Pakistan** on July 13, 1995 (Asadh, 29, 2052).

As all of you know, it had already been 15 years since the establishment of the Society. And to commemorate the 15th anniversary of the Society in a special way, First Nepal Geological Congress was organised bringing the geoscientists from inside and outside Nepal together for two days in a single platform providing the opportunity for sharing of knowledges and experiences as well as dissemination of findings of geological

researches among ourselves. We are of firm opinion that it had contributed to a certain degree in the fulfillment of the objectives of our Society and such kind of activity shall be continued in future also. We hope that the General Body will spare some time to discuss on how to make it a regular event in future. We are determined to bring the Proceedings of the First Nepal Geological Congress as one of the publication of the Society by August 1996.

From day after tomorrow i.e. from Sunday, we are organising a "SCIENTIFIC WRITING WORKSHOP" which will be conducted by Prof. P. G. Cooray from Sri Lanka. We had hoped that it will be beneficial to the participants in further strengthening their technical writing skills.

The strengthening of NGS library is a matter of concern and in this respect, we have been able to make only a little progress. To add to the Society's Library collection, we are receiving HIMALAYAN NOTES (an international newsletter on the Natural History, Earth Sciences and the Environment of the Himalaya, the Karakorum, and Tibet) regularly from Dept. of Geology, Arizona State University via Institute of Geology, Dept. of Geosciences, Zurich, Switzerland. The exchange program of publication has been started with the Wadia Institute of Himalayan Geology, India and for the furtherance of this relationship, we will be communicating with them. Our effort with other institutes will also be continued.

The issue of representation of the Society in various organisations or national committees such as IGCP, RONAST, ENVIRONMENTAL PROTECTION COUNCIL etc. has been raised by the General Body time and again. However, we are pleased to be able to inform the General Body that Dr. Dibya Ratna Kansakar is representing the

Society in the IDNDR National Committee on behalf of the President of the Nepal Geological Society as arrangement was made before that the President of the Nepal Geological Society to be an ex-officio member of the national committee of IDNDR.

I would also like to inform the General Body at this time that the Society has total of 378 members by now, out of which 348 are full members and 30 are associate members. Out of 348 full members, 265 are life members and 83 members. International members from various countries make up 34% of total (i.e. 119 foreign members) and Nepali members make up 66% (229 Nepali members).

Well, whatever we were able to achieve after taking the office of Executive Committee since September 1st, 1994 in meeting the objectives of the Society, it had always been with your help, support and advice. At this moment on behalf of the Executive Committee and personally myself, I would like to offer our sincere thanks to all of you for your active cooperation and continued support in whatever way we needed at various times. Also, various governmental and non-governmental agencies, organizations, consulting and business groups as well as international agencies had provided technical, logistic and financial support to the Society and the 8th Executive Committee would like to extend heartfelt thanks to those organisations and agencies and hope that such cooperation will be continued in the future also. Particularly, I would like to mention here the names of following organisations:

- Department of Mines and Geology,
- Petroleum Exploration Promotion Project,
- Ground Water Resources Development Project,
- Department of Irrigation,
- Central Department of Geology,

-Department of Geology, Tri-Chandra
Campus,
-Nepal Electricity Authority,
-Nepal Electricity Development Center.

I would like to extend heartfelt thanks to coordinators and members of all the sub-committees, members of the organizing committee of the First Nepal Geological Congress, members of the Editorial Board and Editors of Special Issues on behalf of the Executive Committee. Sincere thanks are also due to all the donors, advertisers and sponsors for the support in various activities of the Society. If there had been any shortcomings or weakness from our part or the incompletes, I would like to take this opportunity to extend the sincere apology on behalf of the Executive Committee. Also at this moment, we would like to renew our request once again for the continuation of your support, advices and cooperation as well as to point out our

weaknesses and sincerely hope that we will be guided by the respected members of the Society in the time to come.

Finally, based on our working experiences during the past year and other logistic matter, 11th meeting of the 8th Executive Committee had agreed to table the following proposals to the General Body for discussion and approval:

1. Make a decision by the General Body to award full membership to 3 Associate Members as per their application.
2. Revision of subscription rates of Journals of Nepal Geological Society and membership fee if necessary.
3. Decision on time interval of Nepal Geological Congress and how to make it a regular event in future.

Thank you, thank you very much for your time.

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Financial Report by Mr. Babu Raja Aryal, Treasurer Nepal Geological Society

Mr. Chairman,
Respectable Members of the Society,

First of all, I would like to thank you all for providing me this opportunity to present the financial report of Fiscal Year 051/052 as a Treasurer of the Nepal Geological Society.

I have maintained the account according to account's rules and regulations by keeping ledger book, cash book, voucher and necessary bills as usual.

The balance of receipt and payment including letter from the registered auditor are as follows:

बाबुराजा बज्राचार्य
रजिस्टर्ड लेखापरीक्षक

मिति:-

3 Baisak 2053

The Members
Nepal Geological Society
Kathmandu

Gentlemen,

I have audited the attached Receipt and Payment Account for the year ended 32nd Srawan 2052 and reports as follows:

1. I have got all the information and explanations which are required for the purpose of audit.
2. Proper books as required are maintained according to Company's Law.
3. The attached Receipt and Payment Accounts and Income and Expenditure Account is drawn properly up in accordance with records which are made available to me.
4. According to the information given to me the attached Income and Expenditure Accounts prepared for the year ended 32nd Srawan 2052 exhibit true and fair view.

(Babu Raja Bajracharya)
Registered Auditor

ब्रम्हटोल, काठमाडौं, फोन नं. २-९३४०९

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RECEIPT AND PAYMENT ACCOUNT
For the year ended 32nd Srawan 2052

RECEIPT	AMOUNT	PAYMENT	AMOUNT
To Cash	2,479.69	By Advertisement	2,289.40
To Bank	435,205.64	By Auditor Fee	4,000.00
To Advertisement Received	8,700.00	By Computer Service	1,440.00
To Contribution to NGC	149,695.00	By Catering Service	85,475.00
To Contribution from others	16,450.00	By Fuel	5,737.37
To Miscellaneous Income	23,059.30	By Hotel Bill	59,986.94
(Exchange of Dollar)		By Miscellaneous	19,420.50
To Interest Received	17,021.10	By Photocopy	17,169.50
To Life Member Fee	5,300.00	By Postage & Telex	15,216.50
To Associate Member Fee	150.00	By Printing, Stationary & Press	255,977.50
To Ordinary Member Fee	1,350.00	By Refreshment	2,145.00
To Registration Fee	86,085.00	By Remuneration and Salary	5,455.00
To Sales of Journal	26,702.00	By Rent	14,500.00
To HKT (9th HKT income)	176,140.00	By Tax on Interest	337.44
To IDNDR	20,000.00	By Taxi Fare	2,685.00
		By Souvenir Bag	8,000.00
		By Balance	
		*Nepal Bank, Lazimpat	8,215.25
		*Nepal Bank, Bhotahiti	9,949.60
		*Nepal Bank, Fixed	37,000.00
		*Nepal Bank, Saving	2,822.78
		*Nabil Bank, Saving	40,057.80
		*Nabil Bank, Fixed	29,000.00
		*Nabil Bank Dollar (3695.10)	197,730.50
		*Agri. Dev. Bank, Saving	7,003.22
		*Agri. Dev. Bank, Fixed	37,000.00
		*Cash in hand:	99,723.43
		*Cash	6,608.43
		*Dollar (224x55)	12,320.00
		*Cheque	80,795.00
	<u>968,337.73</u>		<u>968,337.73</u>

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- Environmental engineering and impact evaluation
- Preparation of tender documents, specification and training and maintenance programme
- Construction management and supervision of construction works etc.

NEPAL GEOLOGICAL SOCIETY
INCOME AND EXPENDITURE ACCOUNT
For the year ended 32nd Srawan 2052

EXPENDITURE	AMOUNT	INCOME	AMOUNT
To Advertisement	2,289.40	By Advertisement Received	8,700.00
To Auditor Fee	4,000.00	By Contribution (NGC)	149,695.00
To Computer Service	1,440.00	By Contribution (Other)	16,450.00
To Catering Service	85,475.00	By Misc. Income	23,059.30
To Fuel	5,737.37	(Exchange of Dollar)	
To Hotel Bill	59,986.94	By Interest Received	17,021.10
To Miscellaneous	19,420.50	By Life Member Fee	5,300.00
To Photocopy	17,169.50	By Associate Member Fee	150.00
To Postage and Telex	15,216.50	By Ordinary Member Fee	1,350.00
To Printing, Stationery & Press	255,977.50	By Registration Fee	86,085.00
To Refreshment	2,145.00	By Sales of Journal	26,702.00
To Remuneration and Salary	5,455.00	By HKT (9th HKT Income)	176,140.00
To Rent	14,500.00	By IDNDR	20,000.00
To Tax on Interest	337.44		
To Taxi Fare	2,685.00		
To Souvenir Bag	8,000.00		
To Surplus (excess of income over expenditure)	30,817.25		
	<u>530,652.40</u>		<u>530,652.40</u>

Treasurer

Secretary

President

Auditor

List of Contributors (Donors)

1.	BGR	12,000.00	8.	Multi Disp.	10,500.00
2.	DPTC	20,000.00	9.	National Drilling	15,000.00
3.	GEOCE	8,000.00	10.	NESS	5,000.00
4.	Godavari Marble	80,795.00	11.	RONAST	15,000.00
5.	Himal Sherpa	5,500.00	12.	Sub-structure	5,500.00
6.	ICIMOD	94,140.00	13.	Dr. Richard Brown	55,000.00
7.	METCON	10,000.00		(1,000x55)	
					<u>336,435.00</u>

*Best Wishes
and
Hearty Felicitations
on the
Auspicious Occasion
of*

46th National Democracy Day

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अपरान्ह सम्पन्न भएको नेपाल भौगर्भिक समाजको सोझै वार्षिक साधारण सभामा समाजका सचिव डा.श्री राजेन्द्र बहादुर श्रेष्ठले समाजको वार्षिक प्रतिवेदनका साथै छलफल तथा निर्णयार्थ बैठकको एजेण्डा प्रस्तुत गर्नु भयो । समाजको वार्षिक प्रतिवेदनको प्रस्तुति पछि समाजका कोषाध्यक्ष श्री बाबुराजा अर्यालले समाजको वार्षिक आय-व्ययको प्रतिवेदन साधारण सभामा प्रस्तुत गर्नु भयो । त्यसपछि बैठकमा प्रस्तावित एजेण्डा अनुसार विस्तृत छलफल भयो । उक्त छलफल कार्यक्रममा समाजका सदस्यहरूबाट सक्रिय सहभागिता भई विभिन्न प्रस्तावहरू निम्न बमोजिम गर्ने गरी पारित गरियो ।

१. समाजका सचिव डा.श्री राजेन्द्र बहादुर श्रेष्ठले उक्त अवसरमा नेपाल भौगर्भिक समाजको विभिन्न कार्यक्रम तथा प्रतिवेदनहरूका साथै समाजबाट प्रकाशित हुने जर्नल र समाचार पत्रिकाबारे प्रकाश पार्नु भयो । त्यस्तै जर्नलहरूको Price review गर्ने र सदस्यहरूलाई प्रत्येक प्रकाशन (Issue) निःशुल्क उपलब्ध गराउनु पर्ने हो की र साथै पुराना Volume हरू मूल्य घटाई विक्री गर्ने कि भन्ने प्रस्ताव गर्नु भयो ।

२. श्री निरेन्द्र ध्वज मास्केले यस समाजबाट प्रकाशित हुने प्रकाशनहरूमा र भारतबाट प्रकाशित हुने प्रकाशनहरूमा मूल्यको फरक के कस्तो छ भनेर सोध्नु भयो । उक्त प्रश्नको जवाफमा अध्यक्ष श्री कृष्ण प्रसाद काफ्लेले भारतबाट प्रकाशित जर्नलहरूमा छपाई कागजको गुणस्तर त्यति राम्रो नभएकोले त्यहाँको प्रकाशन हाम्रो प्रकाशन भन्दा सस्तो भएको हो भन्नु भयो । श्री निरेन्द्र ध्वज मास्केले कम गुणस्तरको छपाई कागज प्रयोग गरेर र साथै भविष्यमा जर्नलहरू कम प्रति छापेर समाजलाई

आर्थिक भार सकेसम्म कम पार्नु पर्ने राय प्रकट गर्नु भयो ।

३. यसै सिलसिलामा डा.श्री पिताम्बर गौतमले जर्नलहरूको मूल्य भन्दा छपाई खर्च महंगो भएकोले कम लेखहरू मात्र समावेश गरेर छाप्नु पर्ने स्थितिमा रहनु भन्दा दुई वर्षको एक पटक मात्र छापने हो कि भन्ने सुझाव गर्नु भयो । श्री कृष्ण प्रसाद काफ्लेले २ वर्षसम्म छपाईको लागि पर्खदा Scientific Data पुरानो हुन जाने भएकोले हालकै रूपमा वर्षको एक Volume छपाई गरी राख्नु उचित हुने सुझाव व्यक्त गर्नु भयो ।

४. डा. श्री विशाल नाथ उप्रेतीले वार्षिक रु ५०/- सदस्यहरूबाट उठाउने र जर्नलहरू सदस्यहरूलाई निःशुल्क उपलब्ध गराउने हो कि भन्ने राय दिनु भयो । यसै प्रसङ्गमा समाजका मानार्थ सदस्य डा. श्री चन्द्रकान्त शर्माले वार्षिक रु ५०/- सदस्यहरूबाट उठाउने तर विदेशी सदस्यहरूबाट हुलाक खर्च आदि पनि लिने हो कि भनेर राय दिनु भयो । यसै प्रसङ्गमा श्री जगदिश्वर नाथ श्रेष्ठले समाजका सदस्यहरूबाट अगावै एकमुष्ट रकम उठाई सो को व्याज आम्दानीबाट जर्नलहरू सदस्यहरूलाई उपलब्ध गराउने हो कि भन्ने सुझाव दिनु भयो ।

५. अध्यक्ष श्री कृष्ण प्रसाद काफ्लेले आफ्नो कार्यकालको अनुभवको आधारमा विदेशीहरूको लागि जर्नलहरू महङ्गो भएको विचार प्रकट गर्नु भयो । त्यसकारण जर्नलको मूल्य विदेशीहरूको लागि \$ 10.00 बाट \$ 5.00 गर्ने कि भन्ने राय दिनु भयो । यसै सम्बन्धमा डा. श्री विशाल नाथ उप्रेतीले समाजका विदेशी सदस्यहरूलाई जर्नल वितरणमा कठिनाई भएकोले उनीहरूबाट Postal Charge लिएर जर्नलहरू निःशुल्क वितरण गर्नु पर्ने भनेर सुझाव दिनु

भयो । श्री निरेन्द्र ध्वज मास्केले निःशुल्क वितरण गर्नु हुँदा भनेर आफ्नो राय दिनु भयो ।

६. डा. श्री चन्द्रकान्त शर्माले पुरानो जर्नल को मूल्यमा ५० प्रतिशत छुट गरेर सदस्यहरूलाई बिक्री वितरण गर्नु पर्ने सुझाव दिनु भयो । डा. श्री विशाल नाथ उप्रेतीले पुरानो जर्नल भन्नाले कहिले सम्मको अथवा कुन Volume सम्म पुरानो भनेर मान्ने, जस्तै बित्तिको वर्ष सम्मकै लागि मान्ने हो कि भन्ने जिज्ञासा राख्नु भयो । डा. श्री पिताम्बर गौतमले हालको स्थितिमा Special Volume बाहेक Volume 8 सम्मको जर्नलहरू पुरानो मानेर सोही अनुसार छुट दिई बिक्री गर्ने हो की भन्ने आफ्नो सुझाव दिनु भयो । यसै प्रसंगमा Volume 8 सम्मको जर्नलहरू (Special Volume बाहेक) समाजका सदस्यहरूलाई ५० प्रतिशत छुट दिई अर्थात् रु २०/- मा बिक्री गर्ने भनेर सर्व सम्मतिबाट निर्णय भयो ।

७. श्री जगदिश्वर नाथ श्रेष्ठले Nepal Geological Congress नियमित रूपमा संचालन गर्ने प्रस्ताव सम्बन्धमा यस किसिमको भेला कम्तीमा ३-४ वर्षमा एक पटक गर्नु पर्ने तर यदि साधन र स्रोतले भ्याएमा अझ कम समयमा पनि आयोजना गर्न सकिने सुझाव दिनु भयो । डा. श्री चन्द्रकान्त शर्माले विदेशमा नेपाल भौगर्भिक समाजको प्रचारप्रसारको लागि यस किसिमको भेला कम्तीमा दुई वर्षमा एक पटक आयोजना गर्नु पर्ने र साथै ४ वर्ष भनेको वैज्ञानिक अनुसन्धान कार्यमा लामो समय हुने भएकोले दुई वर्षको फरकमा आयोजना गर्नु उचित हुने आफ्नो मनशाय प्रकट गर्नु भयो । यसै प्रसङ्गमा श्री कृष्ण मुरारी अमात्यले यस किसिमको गोष्ठी आयोजना गर्दा समाजलाई आर्थिक भार बढी पर्ने भएकोले ३-४ वर्षको अन्तरालमा गर्नु

उपयुक्त हुन्छ भनेर सुझाव दिनु भयो । डा. श्री दिव्य रत्न कसाकारले २ वर्षको अन्तरालमा भेला आयोजना गर्दा कार्यकारिणी समिति धेरै व्यस्त हुने तर साथै ४ वर्षमा गर्दा एउटा कार्यकारिणी समिति यस कार्यबाट बन्चित हुन जाने हुन्छ । त्यसकारण ३ वर्षमा गर्दा उपयुक्त हुन्छ कि भनेर आफ्नो राय दिनु भयो । यस बारेमा विस्तृत विचार विमर्श पछि ३ वर्षमा Congress आयोजना गर्दा उपयुक्त हुन्छ भनेर अधिकांस सदस्यहरूबाट समर्थन जनाईयो ।

८. श्री गंगा बहादुर तुलाधरले यस समाजको Volume 10, Special Issue को प्रकाशन कार्यको लागि १० जना सदस्य भएको Editorial Board गठन नैसर्गिक पछि पनि उक्त प्रकाशनमा किन दुई जनाको नाम Special Editor को रूपमा समावेश गरिएको हो र साथै हरेक Issue मा फरक फरक Editor हरूको थप व्यवस्था गर्नुपर्ने हो की कसो भनि प्रश्न गर्नु भयो । अध्यक्ष श्री कृष्ण प्रसाद काफ्लेले नियमित रूपमा गठित Editorial Board ले यस समाजको नियमित प्रकाशन कार्य गर्नु पर्ने भएकोले Special Volume को थप प्रकाशन कार्य पनि गर्नु पर्दा अतिनै व्यस्त हुने र समयले भ्याउन नसक्ने हुनाले यस किसिमको विशेष Editorial Board गठन गरिएको जानकारी दिनु भयो । श्री तुलाधरले पहिलेनै नियमित रूपमा गठित Editorial Board ले कार्यकारिणी समितिको मातहतमा काम गर्नु पर्दछ, यदि यसरी गठित Editorial Board ले काम गर्न समयले नभ्याउने भनेर अर्को थप Editorial Board गठन गर्नु कहाँसम्म मनासिव हो भनी प्रश्न गर्नु भयो । यो प्रश्नको जवाफ दिँदै श्री कृष्ण प्रसाद काफ्लेले Editorial Board बाट अरु जर्नल सम्बन्धी काम भइरहेकोले Volume 10, Special Issue को प्रकाशनको लागि थप समय दिन नभ्याएको कारणले गर्दा दुई जना

यप Editor को व्यवस्था गर्नु परेको हो भनी पुनः जोड दिनु भयो ।

९. डा. श्री चन्द्रकान्त शर्माले Volume 10, Special Issue छपाउंदा महगो भयो भन्ने विचार प्रकट गर्नु भयो । यस प्रसङ्गमा अध्यक्ष श्री कृष्ण प्रसाद काफ्लेले Paper Quality राम्रो भएकोले अलि महगो पर्न गएको हो भनी जवाफ दिनु भयो ।

१०. Paper Quality ले गर्दा महगो हुन गएको भन्ने अध्यक्ष श्री काफ्लेलेको भनाईको सिलसिलामा समाजका सदस्य श्री उपेन्द्र भक्त प्रधानाङ्गले Volume 10, Special Issue को विशेष गुणस्तरको छपाई कागज विदेशीहरूको लागि मात्र हो कि ? समाजका स्वदेशी सदस्यहरूको लागि पनि हो भन्ने प्रश्न गर्नु भयो । अन्तरराष्ट्रिय स्तरको छपाई कागज भनेर नेपाली सदस्यहरूले पैसा तिरेर जर्नल किन्न गाह्रो हुने भएपछि कागजको Quality मा भएको अतिरिक्त खर्च चित्त बुझ्दो नभएको भनेर आफ्नो प्रतिक्रिया दिनु भयो ।

११. श्री कृष्ण मुरारी अमात्यले कार्यकारिणी समितिले समाजको रकम कतिसम्म खर्च गर्न सकिने हो र आफ्नो कार्यकाल समाप्त हुँदा सम्ममा कति रकम बाकी राख्नु पर्नेहो भन्ने बारेमा साधारण सभाको ध्यानाकर्षण गर्नु भयो । श्री नरेन्द्र बहादुर कायस्थले कार्यकारिणी समितिलाई खर्च गर्न बन्देज लगाइनु मनासिव हुदैन यदि यसो गरिएमा पछि आउने कार्यकारिणी समितिलाई कार्य सम्पन्न गर्न गाह्रो पर्दछ भनी सुझाव दिनु भयो । डा. श्री चन्द्रकान्त शर्माले कुनै पनि कार्यकारिणी समितिले आफुले कार्यभार सम्हालेको समयमा जिम्मा लिएको रकम भन्दा कार्यभार सिध्याएर जाने बेला सम्ममा समाजको कोषमा रकम थप वढाएर जाने प्रथा हुनु पर्‍यो भनी राय दिनु भयो ।

१२. श्री देवी नाथ सुवेदीले Life Member कं. पैसा मुद्दती खातामा राखेर व्याज आर्जन गर्नु पर्नेमा सो को व्याज कता गयो भनि प्रश्न गर्नु भयो ।

१३. समाजका कोषाध्यक्ष श्री बाबुराजा अर्यालले प्रस्तुत गर्नु भए अनुसारको समाजको अनुमानित खर्च विवरण सम्बन्धमा समाजका सदस्यहरूले बढी खर्च भयो भनि प्रश्न गर्दा समाजका उपाध्यक्ष डा. श्री दिव्य रत्न कंसाकारले पहिलेको सातौं कार्यकारिणी समितिको खर्च पनि यस आर्थिक वर्षमा व्यहोर्न परेकोले यस्तो समस्या पर्न गएको हो भनि जवाफ दिनु भयो । तत्पश्चात यस समाजका सदस्य तथा तत्कालिन कोषाध्यक्ष श्री शारदेश राज शर्माले उपाध्यक्ष डा. श्री दिव्य रत्न कंसाकारको भनाईलाई खण्डन गर्दै त्यसको बदलामा बरु वितेका कार्यकारिणी समितिको आम्दानी समेत यस आठौं कार्यकारिणी समितिको आय-व्ययमा समावेश भएको छ भन्ने विचार व्यक्त गर्नु भयो ।

१४. श्री भरत मणि ज्वालीले अब प्रकाशित गर्ने भनिएको First Nepal Geological Congress (NGC-I) को Proceeding छापदा समाजलाई अनुमानित कति व्ययभार पर्न जाला भन्ने जिज्ञासा राख्नु भयो । सो को जवाफ दिदै अध्यक्ष श्री कृष्ण प्रसाद काफ्लेले राष्ट्रिय योजना आयोग, नेपाल राजकिय विज्ञान तथा प्रविधि प्रज्ञा प्रतिष्ठान तथा अन्य संस्था र व्यक्तिहरूबाट समेत आर्थिक सहयोग संकलन गरी समाजलाई सकेसम्म न्यून व्ययभार पारिने जानकारी दिनु भयो ।

१५. दुई जना Associate Member हरूलाई बहाहरूको निवेदन बमोजिम साधारण सदस्यता प्रदान गर्ने विषयलाई साधारण सभामा छलफलमा ल्याइएको थियो । उक्त छलफलमा श्री भरत मणि ज्वाली र

श्री जगदिश्वर नाथ श्रेष्ठले यदि निवेदकहरूले समाजको नियम अनुसार हालसम्मको वार्षिक शुल्क तिरेको छ भने साधारण सदस्यता प्रदान गर्न सकिन्छ । यदि वार्षिक शुल्क तिरेको छैन भने साधारण सदस्यता प्रदान गर्न मिल्दैन भनेर आफ्ना विचार प्रकट गर्नु भए अनुसार अरु सदस्यहरूले पनि उक्त विचारलाई समर्थन गर्नु भयो ।

साधारण सभाको एजेण्डा अनुसार विविध विषयमा छलफल गर्दै डा. श्री चन्द्रकान्त शर्माले Nepal Medical Council जस्तै Nepal Geological Council गठन गर्नु पर्ने सुझाव दिनु भयो । Council बनाउदा संसदबाट ऐन नियम पास गर्नु पर्ने हुन्छ, त्यसकारण Council गठन गर्नको लागि आवश्यक पूर्वाधार तयार गर्न Medical Council संग सम्पर्क राखी कार्यविधि तथा नियम कानून सम्बन्धी बुझ्न र यस

कार्यलाई अगाडि बढाउन एउटा कार्य समितिको गठन गर्नुपर्ने आवश्यकतामा जोड दिनु भयो । साथै विदेशी अनुसन्धानकर्ताहरूले नेपालमा काम गर्दा Nepal Geological Council बाट अनिवार्य स्वीकृति लिनु पर्ने व्यवस्था गर्नु पर्ने भनि जोड दिनु भयो । उक्त विषयमा छलफल हुँदा सबै सदस्यहरूबाट आफ्नो सहमति भएको जानकारी दिनु भयो ।

साधारण सभा समाजका सदस्यहरूको उत्साहपूर्ण सहभागिताले विभिन्न विषयमा छलफल तथा निर्णय गरी सोही दिन सांझ सात वजे सम्पन्न भयो । उक्त साधारण सभाको अन्त्यमा अध्यक्ष श्री कृष्ण प्रसाद काफ्लेले सहभागी सदस्य साथीहरूलाई वहाँहरूको उत्साहपूर्ण सहभागिताको लागि धन्यवाद ज्ञापन गर्नु भयो । सोही अवसरमा समाजको नयाँ प्रकाशन Member's Directory समाजका सदस्यहरूलाई वितरण गरिएको थियो ।

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FIRST NEPAL GEOLOGICAL CONGRESS (NGC-I)

August 15-16, 1995

Kathmandu, Nepal

Welcome Speech by Mr. K. P. Kaphle, President Nepal Geological Society

Mr. Chairman,
The Chief Guest Honorable Finance Minister
Mr. Bharat Mohan Adhikari,
Honorable Ministers,
Respected Secretaries of ministries of His
Majesty's Government of Nepal,
Their Excellencies,
Distinguished Scientists and Honorable Guests,
Fellow members of Nepal Geological Society,
Ladies and Gentlemen

It gives me a great pleasure to have this opportunity to welcome you all to this Inaugural Ceremony of First Nepal Geological Congress on behalf of Nepal Geological Society. I am grateful to our Chief Guest, Honorable Finance Minister Mr. Bharat Mohan Adhikari, for giving his precious time to be with us to inaugurate the Congress and deliver his inaugural speech. We are much encouraged by your presence, Mr. Minister.

I welcome the distinguished Scientists from various countries of Asia, Europe, America and Australia who travelled long distances to Kathmandu to participate and contribute papers to this Congress. Your presence here in this scientific meeting will provide an opportunity to discuss on various aspects of geology of the Himalayan Region and share your valuable experience and exchange ideas. You have been directly involved in the geological researches in the Himalayas and we the geoscientists of Nepal highly value your scientific efforts and contributions. I am sure that we Nepalese

scientists will learn about the findings of your geological researches in the adjoining areas and in specific aspects of Himalayan Geology. We Nepalese geoscientists will be talking about our works and share views with you. Thus, I hope that all of us will be benefited from this scientific meeting.

The Nepal Geological Society is about to complete its 15th year. It is a scientific professional Society. At present it has a membership of 348 geoscientists from Nepal and from abroad. It has permanent regional focal points in Europe, America, Australia, Japan and SAARC Region. Publication of the scientific Journal of Nepal Geological Society and the Bulletin of the Society has been regular and continuous since the last 15 years. Organization of Seminars, Workshops and scientific Talk Programs are the main regular activities of our Society. In such scientific meetings we present specific papers on the research findings and discuss the relevancy of the researches to the development of the geological sciences. Such meetings are absolutely necessary for the earth scientists to keep abreast of the recent advancements in theoretical as well as applied aspects of the science. In our meetings the participants are required to pay the registration fees to meet the expenses. We are generally supported by companies and mineral-based industries and other scientific institutions largely for the publication of the proceedings. In this aspect,

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our meeting is different from so many other workshops and seminars.

The Society has been successfully organizing National as well as International Seminars/Workshops in the past. For instance last year the Society organized the International 9th Himalaya-Karakorum-Tibet Workshop in Kathmandu in which over 250 participants from 27 countries participated and discussed the various problems of Geology of the region. Proceedings of the Workshop has already been published. It is regarded necessary by the Nepalese geoscientists that Nepal should express her commitments for the organization of South Asia Geological Congress (GEOSAS) in Nepal in near future. GEOSAS is a regional forum for the geoscientists of SAARC countries taking place every three years. But the national commitments and decisions to hold the meeting are to be made at least four years in advance. GEOSAS-I was organized in Pakistan in 1992 and GEOSAS-II in Sri Lanka in January this year. GEOSAS-III is to be held in Bangladesh in 1998.

So, we urge the Government to decide in favor of hosting the GEOSAS-IV in Kathmandu in 2001 AD. Nepal Geological Society expresses its commitments to undertake all responsibilities to serve as the co-organizer together with the governmental institution such as the Department of Mines and Geology and the Central Department of Geology of the Tribhuvan University. We are confident of our capabilities to organize such regional meeting.

This First Nepal Geological Congress (NGC-I) has been organized on the auspicious occasion of our Society's 15th Anniversary. An Organizing Committee has been formed to conduct the Congress. We firmly believe that it will prove itself as an effective forum for presenting and discussing the research findings

and identified problems of the Himalayan Geology. We plan to make it yet another regular scientific event of the Society, taking place every two years.

For this Congress we received about 200 responses from the geoscientists from all over the world. But one third of them (mainly from SAARC countries) could not take part because of unavailability of financial support for their participation. Total number of abstract of the research papers received is 85. All of them are included in the Abstract Volume of the Congress. However, only 35 papers on various aspect of geology and 5 Key-Note addresses from distinguished scientists will be presented and discussed in 6 technical sessions in the next 2 days. We look forward to active discussions and fruitful conclusions.

The Society is actively contributing in the task of the National Development. Members of the society contribute in the National Committee for International Decade for Natural Disaster Reduction, the Environmental Protection Council and in the National Body of the International Geological Correlation Program. The Society has been actively cooperating with the government and other organizations in the task of National Development, Environmental Protection, Natural Disaster Reduction and Infrastructure Development. It seeks to provide scientific basis for the various programs of National Development, Environmental Protection, Disaster Mitigation and effective utilization of Water and Mineral resources etc. But we know that there are many more areas and sectors of national economy where the services of geoscientists have either not been utilized at all or the scope of their services extremely limited. For instance, the whole discussions on the problems of solid waste disposal and sanitary landfill site development goes on without any participation of geologists

and/or hydrogeologists. Obviously, we the geoscientists of Nepal need to redouble our efforts to convince the decision makers and planners about our potentials and abilities.

The Society is run by contributions from its members. It has great financial constraints. So, in spite of our efforts, we could not provide financial support for so many scientists who expressed their strong desire to participate in this Congress. Whatever we could, it was because of the close cooperation received from its members, well wishers and sponsors such as the different engineering consulting companies and mineral based industries of Nepal. This has been quite encouraging for us. Part of the fund received from these organizations are being utilized for facilitating the participation of young scientists, for publication and for logistics. We are also receiving cooperations from the different organizations of His Majesty's Government of Nepal, such as the

National Planning Commission, Royal Nepal Academy of Science and Technology, Department of Mines and Geology, Petroleum Exploration Promotion Project, Department of Irrigation/Ground Water Development Project and also from the Central Department of Geology, Tribhuvan University. I am confident that this meeting will provide an opportunity to the participants to communicate and exchange scientific ideas, share experiences and disseminate the geological information on Himalayan geology. All the discussions and deliberations in the following scientific meetings will help to identify the common geological problems and problem areas for concentrating further researches for the benefit of the countries of the Himalayan Region.

I welcome you all once again to express your ideas, feelings and findings in the following technical sessions which will continue till tomorrow evening.

I thank you all for your attention.

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**Inaugural Speech by
Honorable Finance Minister Mr. Bharat Mohan Adhikari
to the
FIRST NEPAL GEOLOGICAL CONGRESS (NGC-I)
on August 15, 1995**

Mr. Chairman,
Distinguished Scientists from Friendly
Countries,
Participants to the Congress,
Ladies and Gentlemen.

It is a privilege for me to be invited to this important meeting of geoscientists and engineers organised on the occasion of the fifteenth anniversary of the Nepal Geological Society. I extend my thanks to the organisers for giving me this opportunity to inaugurate this First Nepal Geological Congress.

It is indeed a pleasure to know that so many scientists of different countries have been devoting their efforts in the geological researches of the Himalayas. The representation to this Congress of scientists from several countries of Asia, Europe, America and Australia is an evidence to it. It is wonderful that there has been established a history and tradition of international cooperation and joint efforts in uncovering the geological mysteries of the Himalayas, in revealing and developing the mineral and water resources of the region, in establishing the geological control of the environment, in uncovering the cause-effect relationship between the geological conditions and the occurrences of geological hazards.

The Nepal Geological Society deserves congratulations for organising this meeting. I

am glad to know that the Society has been able to coordinate the efforts not only of Nepalese geoscientists but it has a strong international membership also. The network it has established makes it look like an international centre giving opportunities to the Nepalese geoscientists to effectively communicate with their counterparts from other countries. It is highly commendable that the Nepal Geological Society has been publishing a scientific journal and a News Bulletin which have world-wide circulation. This is a substantial achievement for the scientific community of a country which is faced with a multitude of problems including acute shortage of resources.

The geoscientists of Nepal have done much in the development of the country by putting their efforts in geological mapping and mineral exploration, environmental studies and mapping of natural hazards such as landslide, debris flow and earthquake, in utilization of water resources of the country and in educating and training young Nepalese by preparing appropriate training curriculum of study in the university, and in raising the general awareness on the importance of geology in the task of national development. Thanks to the geoscientists of this country, we in Nepal are applying the knowledge of geology in the planning, design and implementation of infrastructure projects such as dam, road, irrigation, hydroelectricity, water supply, town planning, and exploitation

of mineral resources and construction materials such as marbles. Similarly, the Nepalese geoscientists are contributing to the country much not only by their researches on natural hazards such as earthquakes, landslides, Glacier Lakes Outburst Flood but also by their recommendations for a sound and economic design for their effective mitigation. We in Nepal have been utilising extensively the geological knowledge in the management of environmental protection works as geological conditions constitute one of the main components of Himalayan Environment.

The Government attaches high importance to such contribution of the Nepalese geoscientists. This fact is reflected also in the inclusion of the representatives of Nepal Geological Society and geologists in the high level committees such as the National Committee for the International Decade for Natural Disaster Reduction and the National Environmental Protection Council. His Majesty's Government of Nepal will continue looking to the earth scientists of Nepal for their help in the task of effective utilization of the mineral and water resources, in the mitigation of natural hazards, in the solution of environmental problems, in the task of infrastructure development. We will try to create new positions for earth scientists as

appropriate in the various line agencies of the government. At the same time we expect the private sector such as mineral-based industries and consultancies also to realise such necessities. The government will do its best to assist this community in the development of professionalism, in facilitating regional scientific cooperation. At the same time I request the scientists gathered here to constantly remember their responsibility to accelerate the economic development of the country and help solve the problems of poverty.

I am sure that the deliberations during the days to follow will help you take yet another step closure to revealing the geological mysteries of the Himalayas, identifying the generalities of mineral occurrences in this region, unveiling the intricate relationship between the environment and geologic processes, in identifying the effective means for the mitigation of natural hazards and safeguarding the infrastructure.

I hope that the brief stay of our foreign guests in Kathmandu will be comfortable and pleasant.

I thank the organizers again for giving this opportunity to be with you and share some of my feelings.

Address by Dr. C. K. Sharma, Chairman of the Inaugural Session to the First Nepal Geological Congress (NGC-I)

Our Chief Guest Honorable Minister of Finance,

Dr. Robert West,

Prof. Ansu K. Sinha,

Dr. Mohammad Ali Mirza, Prof. Monirul Haq, Prof. K. Kizaki,

Their Excellencies of different embassies and donor agencies,

Vice-Chancellor and rector of T.U.,

High Ranking Government Official,

Fellow Scientists, academicians and co-workers,

Invited Distinguished Guests,

Ladies and Gentlemen.

It is a great honor and privilege for me to chair this inaugural function of First Nepal Geological Congress which is being organized by Nepal Geological Society for two days. Furthermore, realizing the importance of this seminar our Right Honorable Prime Minister agreed to inaugurate the seminar but unfortunately he and his entourage met an helicopter accident yesterday while returning to Kathmandu from their field visits. I take this opportunity to express our sincere concern for his health and on behalf of this house pray with the God for his and his members early recovery. In this critical time, we are thankful to our Honorable Finance Minister Mr. Bharat Mohan Adhikari who took trouble to come over here and inaugurate the same in short notice in spite of his busy schedule. He is a prominent economist, matured lawyer and an eminent politician. The Nepal Geological Society after its 15 years of existence, is

able to organize the First Nepal Geological Congress and it is hoped that such Congress will be organized in the future.

Nepal Geological Society is a purely scientific organization started by Nepalese geologist 15 years ago and it runs purely on the small contributions made by its members and also sale of its valuable journals. The Society now seems to grown up its adulthood by hard work of Nepalese geologists and realizing the importance now we have a long list of foreign members also. The journals are published annually without any break and circulated widely all over the world for the scientists who are interested in the Himalayas.

Let me say again that it is a forum of Geoscientists where one can exchange ideas and learn from each others experience through its publication, seminar, and symposium which it conducts annually.

Members of Nepal Geological Society come from different walk of life i.e. from academic to government organization on one hand, from students to consultants on the other. All the members are contributing in national development from their position.

It is now realized that the knowledge of earth on which entire civilization is resting has become important for the development of society. Geoscience helps in understanding the behavior and character of earth's surface and also its interior. It also

helps in harvesting mineral resources, groundwater, petroleum and others which are basic raw material for the development of society. This science has been more important in Nepal Himalaya as Indian plate thrust under the Tibetan and causes earth tremor from time to time. Some times, earthquakes are quite destructive e.g., 1934 and 1948. In both cases Nepal lost many lives and property. Furthermore, earthquake induced disaster creates landslide and block the entire river and which after burst creates another disasters. To understand such disasters and mitigate the hazard, the Geoscience has become a must for a country like Nepal.

Unfortunately we are late in the development of this sciences in this sub continent. As you know that Indian Geological Survey was created some times in 1850 whereas Nepal Geological Survey started furnishing in 1950 i.e. a 100 years gap. Though we were late to start the hard work done by limited and the inexperienced Nepalese geologists to bring the work at par with other SAARC countries is definitely commendable. By now Nepal has raw materials for cement, talc, magnesite, and also a lot of metallic minerals. Our scientists were able to trace the vast ground water potential of Terai as well as of Kathmandu and we are harnessing. Those who are staying in Kathmandu must realised that the 40% of the water is from ground water.

Seing the seismic hazards, our scientists are monitoring seismic waves and seing the active fault zones, are also helping H.M.G./Nepal to prepare a building codes.

It is certain that most of the high dams of world by volume, height and generation of power will be located in future in Nepal Himalaya as sub-continent needs fresh water and also power. Our scientist have contributed in helping dam engineers to design safely the Karnali, Kosi and Pancheswar highdams with least cost. It must be noted that over design will cost heavily on the construction of dam whereas under designing in seismic zone may cost entire dam and also disasters. Hence, geological study becomes critical for economics as well as safety. In the front of natural hazard mitigation our scientists are helping to Home Ministry even though it does not has a regular geo hazard section. Geologists of Nepal Electricity, are contributing in stabilisation of landslides in the power projects.

Honorable Minister, we are very very sorry to state that we have not been able to help the Road Department of Nepal in geotechnical fields. It is estimated that it spends about 20 to 30 million Nepalese rupees annually to clear the landslide and Road Department works provides classical examples of landslide failure of bridges, unstability of road and heavy expenses on repair and maintainnce.

Annual development expenditure is always outs by a natural disaster, leading to a negative balance. In other words even though we are making progress in km, we are losing heavily from the constructed works. This costs millions of Rs. to Nepal just due to lack of understanding the condition of river bank on which bridge is being constructed. Tinau bridge and

Dhunge bridge were toppled down by landslide just before their inauguration. This needs critical attention that the Road Department which spends billions of rupees has not have a geological section even at the department. They must create a section to prevent annual loss. Likewise Home and Defence Ministry should open geological units to help them in natural hazard management and also in other sectors.

I would not like to go into much detail in explaining the importance of Geo-Sciences but I will stress on that we are having our entire activity on the earth surface and draw heavily resource from the earth. An understanding of our earth above and below is essential if Nepal wants to develop fast and the is true for all developing countries.

Honorable minister and our chief quest, to supply field workers previously we use to receive scholarship from donors and friendly countries in large number and most of us are graduated in such scheme. Now numbers are decreasing whose work volume are increasing.

To meet the demand internally we opened a B.Sc. level geology department in Tri-Chandra College of Kathmandu in 1967 and M.Sc. in Tribhuvan University in 1985 or so. Now about 100 graduates of our own are working in different development projects.

To give boost to time important applied science for nation building, I appeal and request our Honorable Finance Minister to provide extra fund to open geology subject in other degree college of Nepal such as Biratnagar, Butwal and others and also new

universities which are forthcoming should also introduce Geo-Science course. For donor's my appeal is to help our young generation with training in latest technology and also provide equipments and books to colleges.

As you know that we are confining everything in Kathmandu and has created a problem of not only economic unbalance but also environmental problem. Now Tribhuvan University needs to open environmental geology course in M.Sc. level.

We are sorry to state that UN organisation such as UNESCO, WHO and UNIDO have been shy in helping us to stand on our own feet. UNESCO is reluctant to fund seminar and symposium in Nepal and not willing to support travel grant and fellowship to attend seminar in developed countries. This will widen the technological gap between developed and developing countries.

Furthermore, UNIDO could help us in doing feasibility study of small scale cement, talc, magnesite, garnet and other processing plant. We expect such help from donors also to develop small mineral based industries.

I find that it is general grievances of Nepalese scientist that foreigner come under tourist visa and carry the scientific work without local collaboration and publish their document abroad. It may help to enhance their carrier but it is totally unethical and also it is not useful. I request them to collaborate with local so that it is useful for both parties. H.M.G. has to introduce legal provision to discourage such activities.

Members of Nepal Geological Society always felt lack of their own building to house secretariate and other materials. As Nepal Bar Association was able to get land in the compound of Supreme Court, I will urge through the Honorable Minister that Dept. of Mines and Geology which has large member in this hall could provide a small piece of land on lease from their vast paraphenilia. I hope H.M.G. will take positive attitude in this matter for other professional societies also.

Before I conclude I want to stress over and over that Nepal Geological Society is one of the few institution which is running smoothly from its inceptions and has been publishing regular as well as special volume on geological work in Himalaya in general and Nepal Himalaya in particular. Though present Congress is named as a national congress if one sees its list of participants, I hope all will agree that it is international.

I would like to thank Honorable Finance Minister our Chief Guest for his inspiring speech. We are also thankful to fellow scientists from abroad who have taken trouble to come over here and participate in our endeavours. I hope their stay will be comfortable and also memorable.

I would like to thank organising committee for giving me opportunity to chair this session and giving me a chance to speak a few words.

I wish seminar a success and hope that deliberation will be fruitful not only to us but also for our fellow scientists from abroad who are interested to understand about the gigantic wall of Asia i.e. Himalaya which nourishes half of the population of world.

■ Thank you very much.

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Vote of Thanks delivered by Dr. Rajendra B. Shrestha, Secretary of the Nepal Geological Society during the inaugural ceremony of First Nepal Geological Congress (NGC-I)

Mr. Chairman,
Chief Guest: Honorable Minister of Finance
Mr. Bharat M. Adhikari,
Your Excellencies,
Respected Secretaries of different ministries,
Distinguished Guests and Participants,
Dear Fellow Members of the Society,
Ladies and Gentlemen.

On behalf of the Nepal Geological Society and the organising committee and myself in person, I am very much delighted to welcome you all once again to the First Nepal Geological Congress (NGC-I) organised on the auspicious occasion of 15th anniversary of the Society. During the past 15 years, the Society has established itself as a center with international networking in geoscience and thus providing a platform for scientists interested or working in Himalayan region for effective communication among themselves as well as sharing of knowledge and experiences. The First Nepal Geological Congress (NGC-I) is one of the events which, we believe provides such opportunity to all of us. The Nepal Geological Society had organised similar international events twice during the past two years besides other regular national seminars and workshops. The Nepal Geological Society plans to make this Geological Congress a regular international event as we are of firm opinion that it will serve to the better understanding of Himalayan Geology.

At this moment, Honorable Minister, the Society is highly inspired and encouraged by your presence with us this morning. On behalf

of the Nepal Geological Society and the organising committee, Chief Guest Honorable Minister, we would like to extend our sincere gratitude for sparing your valuable time today in inaugurating the First Nepal Geological Congress and for your notable address to this ceremony.

The Society wishes to render its sincere gratitude to Dr. Chandra Kanta Sharma, Member, Royal Nepal Academy of Science and Technology and Honorary Member, Nepal Geological Society for presiding over the inaugural session as the Chairman and your laudable address to the Congress.

The Society would also like to extend its sincere appreciation to honorable ministers, their excellencies, high officials of His Majesty's Government of Nepal, distinguished guests, journalists and other distinguished personalities for offering your valuable time in gracing this inaugural session and contributing to make the First Nepal Geological Congress a success.

Organization of the First Nepal Geological Congress has been made possible by presence of you all, distinguished participants and scientists both from Nepal and abroad and by providing contribution of your valuable scientific papers. The Nepal Geological Society and the organising committee wishes to extend heartfelt thanks to all the distinguished participants and scientists.

On behalf of the Society and personally myself, I would like to thank all the members

of the Congress organizing committee for their active cooperation and contribution for successful organization of the First Nepal Geological Congress.

Various governmental and non-governmental agencies, organizations, consulting and business groups helped the organising committee of the Society by providing financial help and logistic supports for the organisation of the Congress. Sincere acknowledgement is due to the National Planning Commission, HMG/N, Department of Mines & Geology (DMG), Petroleum Exploration Promotion Project, Ground Water Resources Development Project, Dept. of Irrigation, Nepal Electricity Development Center, Central Department of Geology, Tribhuvan University, Department of Geology, Tri-Chandra Campus, and Nepal Electricity Authority for various logistic support extended to the Society.

For the organization of this First Nepal Geological Congress, the Society received generous financial support in various forms from:

1. Godavari Marble Industries (P) Ltd., of Godavari, Lalitpur
2. SILT Consultants (P) Ltd., of Battisputali, Kathmandu
3. National Drilling Company (P) Ltd., (NADCO) of Naya Baneshor, Kathmandu
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7. METCON Consultants, of Tangal, Kathmandu

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9. Himalaya Sherpa Coal Udyog of Baluwatar, Kathmandu
10. Sub-Structural Consult (P) Ltd. of Naya Baneshwor, Kathmandu
11. EAST Consult (P) Ltd., of Lazimpat, Kathmandu
12. EAST Soil Lab & Drilling Company, of Basundhara, Kathmandu
13. Nepal Environmental Science Services (NESS) of Thapathali, Kathmandu
14. National Drilling Company (P) Ltd. (NEDRILL)
15. CEMAT Consultants (P) Ltd., Maitidevi, Kathmandu
16. Himali Ratna Udyog (P) Ltd.

These consulting and business groups are again gratefully acknowledged for the generosity extended to the Society.

Volunteer services have been provided by students from Dept. of Geology, Tribhuvan University. We would like to render our heartfelt thanks to our dedicated volunteers.

Finally, great deal of thanks to all the members of the Society for their cooperation and support in one way or the other in the organisation of the First Nepal Geological Congress.

We sincerely hope that the First Nepal Geological Congress (NGC-I) will be free of shortcomings to the extent possible, however, we know that this may be too much to expect. For any shortcomings or inconveniences, we offer our sincere apologies. Once again, thank you, thank you all.

Excerpt From THE RISING NEPAL

August 16, 1995 (Srawan 31, 2052) Wednesday

Geoscientists' role stressed

Lalitpur, Aug. 15 (RSS):

Finance Minister Bharat Mohan Adhikari inaugurated the "First Nepal Geological Congress" at the Administrative Staff College today.

The two-day congress organised by the Nepal Geological Society is being attended by about 250 geologists and experts concerned from Nepal, India, Pakistan, Bangladesh, the USA, Japan, Austria, Germany, Switzerland and France.

In his inaugural address, Finance Minister Adhikari said Nepal is applying the knowledge of geology in the planning, design and implementation of infrastructure projects such as dam, road, irrigation, hydroelectricity, water supply, town planning and exploitation of mineral resources and construction materials such as marbles.

The Nepalese geoscientists are contributing to the country not only through researches on natural hazards such as earthquakes, landslides, glacier lake outburst flood but also through recommendations for a sound and economic design for their effective mitigation.

We in Nepal have been utilising extensively the geological knowledge in the management of environmental protection works as

geological conditions constitute one of the main components of Himalayan environment, he said, adding His Majesty's Government of Nepal will continue looking to the earth scientists of Nepal for their help in the task of effective utilisation of the mineral and water resources, mitigation of natural hazards, solution of environmental problems and in the task of infrastructure development.

The government will do its best to assist this community in the development of professionalism and in facilitating regional scientific cooperation, he said asking the scientists participating in the congress to constantly remember their responsibility to accelerate the economic development of the country and help solve the problems of poverty.

He expressed the hope that the deliberations at the congress will help take yet another step closer to revealing the geological mysteries of the Himalayas, identifying the generalities of mineral occurrences in this region, unveiling the intricate relationship between the environment and geologic processes, in identifying the effective means for the mitigation of natural hazards and safeguarding the infrastructure.

President of Nepal Geological Society K. P. Kaphle said the society has been actively

cooperating with the government and other organisations in the task of national development, environmental protection, natural disaster reduction and infrastructure development.

From the Chair-Dr. Chandra Kanta Sharma on behalf of the participants of the congress wished Prime Minister Manmohan Adhikari a quick recovery.

He spoke of the need to set up a geological unit under the department of roads.

Secretary of the society Dr. Rajendra Bahadur Shrestha highlighted the objectives of the congress.

Thirty five papers on various aspects of geology and five key-note addresses from distinguished scientists will be presented and discussed at the congress.

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NATURAL HAZARDS AND THEIR MANAGEMENT

Horst Aust

*Federal Institute for Geosciences and Natural Resources (BGR)
Hannover, Germany*

ABSTRACT

The environment is threatened by both natural and man-made hazards. It is therefore the task of the geoscientist to observe, warn, prevent, and propose decontamination measures, in order to protect man and nature, as well as our material and cultural heritage against damages as far as he is able.

Among the natural hazards, the potential danger of earthquakes, volcanism, erosion, mass movements and floods in particular can be determined and analysed in geoscientific studies. The field of environmental geology is of necessity interdisciplinary. Experts in this field need to know what combination of methods are required for a given investigation and how to interpret the results in order to be able to recommend suitable planning and hazard-protection measures.

INTRODUCTION

The hazard potential of natural events may be described by the product of the probability that an event takes place and the predicted loss of life and material damage, including loss of or damage to objects of cultural value (Masure, Kluyver and Sustac 1992). Worldwide, the frequency of natural disasters has increased over the past 30 years (Table 1).

Many of the developing countries are situated in zones that are prone to natural hazards, e.g. earthquakes, volcanic eruptions or floods. The damage caused can be considerable; in some countries the cost of the damage makes up a significant proportion of the GNP. Between 1960 and 1974, natural disasters in Central America caused damage amounting to 2.3% of the GNP (op. cit.). This represents a challenge to geologists and other scientists, such as

engineers, hydrologists, and climatologists, to reduce the hazard posed by natural catastrophic events to an absolute minimum. Special methods and instruments have been developed for this purpose, predominantly in the fields of engineering geology, hydrology, geophysics and geochemistry, which, whether employed alone or on an interdisciplinary basis, have met with considerable success.

EARTHQUAKES

China leads the countries in the world in experience in recording and predicting earthquakes. The Academia Sinica has earthquakes records dating back to 1177 BC; almost all events of magnitude 5 or over that have taken place since 1500 AD can be found in these records (Munich Re, about 1979). It is Chinese scientists, too, who were the first to develop a primitive type of seismograph (132 AD). It

Table 1: World Statistics on Natural Disasters between 1960 and 1980
(Masare, Kluyver and Sustrac 1992)

Cause of Disaster	Climatic ⁽¹⁾	Geodynamic ⁽²⁾	Total
Number of events	21	23	44
Deaths	4,13,000	8,40,000	12,53,000
Mean deaths per event	19,700	36,500	28,500
Mean deaths per year	37,500	76,000	1,13,500
<u>Deaths</u>	Numbr of Events		
Less than 100	11	5	16
Between 100 and 1000	7	5	12
Between 1000 and 10,000	2	7	9
Between 10,000 and 50,000	0	4	4
Over 50,000	1	2	3

(1) Cyclones, storms, flooding, drought

(2) Earthquakes, volcanic eruptions, landslides, mudflows, avalanches.

functioned on the principle of a pendulum which is displaced in the direction of the earthquake epicenter (op.cit.).

Catastrophic earthquakes have occurred in many countries in the past, seriously affecting the lives of thousands of people. No means are known of completely avoiding the earthquake hazard. Many attempts have been made to develop reliable methods of earthquake prediction (Munic Re, 1979; Aust 1985):

- Seismicity:** Monitoring to detect changes in the frequency of seismic activity and in the ratio of magnitude to frequency, as well as in the focal depths of tremors.
- Seismotectonics:** Monitoring of the stress field to detect changes in its direction and strength.

- Seismics:** Measurements of the velocities of compressional and shear waves in the earth's crust.
- Geodetic surveying :** Tilt measurements, precision levelling and distance measurements to detect vertical and horizontal deformation of the earth's surface (e.g. by laser), direct measurement of deformation, e.g. in boreholes.
- Geomagnetics:** Monitoring of the geomagnetic field to detect changes in its intensity.
- Gravimetry :** Monitoring of the earth's gravitational field.
- Geoelectrics :** Measurement of telluric currents or electrical resistivity in the earth.
- Radon :** Measurement of the radon content of the groundwater in wells and springs.

- i. Water wells : Monitoring to detect changes in the depth of the water table, the discharge rate, composition and temperature of the water, and its turbidity and smell.
- j. Oil wells : Monitoring the pressure of the oil.
- k. Observation of anomalous animal behaviour.

An earthquake with a magnitude of 7.3 was predicted in the Haicheng region in China in 1975 with the help of a combination of these methods; in this way it was possible to evacuate the urban population in time (Oike 1978). However, this one success is still negligible in comparison to the approximately 1000 earthquakes recorded annually with magnitudes of 5.0 and greater. Considering the fact that the epicenters of most earthquakes in southern Asia, for example, are below the Pacific Ocean, the problems of earthquake prediction are even greater because the epicenter areas are inaccessible.

At present, the danger of major earthquakes can only be countered by reducing the destructive effects. In this respect, very promising results have been achieved in the fields of earthquake engineering and engineering seismology. Earthquake resistant design for buildings, as well as for industrial installations and facilities, provides adequate safety against injury and loss of life; moreover, it keeps damage to property to a minimum and ensures the continuation of vital services. This can be achieved at acceptable cost, even if traditional materials are used for construction. For these reasons, seismology and engineering seismology should play an important role in all countries of southern

Asia. To achieve these objectives, it is necessary to set up a network of modern digital seismological stations in this region (acc. J. Schlittenhardt, BGR Hannover, 1993).

VOLCANIC ACTIVITY

The following account is based on a publication by Kursten, 1992.

Volcanism is another hazard of the environment. This hazard occurs in the form of lava flows, ejected pyroclastic material, glowing clouds, ash, toxic gases, and earthquakes. Even more hazardous are the secondary phenomena associated with volcanoes: for example, lahars, mud flows resulting from heavy rains on the ash deposits, tsunamis, uplift and subsidence above magma chambers, and fires.

Southeast Asia is particularly affected by volcanic events because many tectonic plate boundaries exist in this area. There are a large number of volcanoes along these plate boundaries that threaten, for example, Indonesia, the Philippines, and Japan. The eruption of Pinatubo in the Philippines and Galunggung in Indonesia illustrates the extent of the damage resulting from such events.

The eruption of Krakatoa in 1883 was one of the most violent of modern times. Twenty cubic kilometers of ash were ejected. Tidal waves were produced that circled the earth several times, killing tens of thousands on the islands of Southeast Asia.

The eruption of Tambora in 1815, also in Indonesia, received less attention. An

estimated 100-150 km³ of ash were thrown into the atmosphere. Large eruptions like these cause a short-term, worldwide worsening of the climate. After the eruption of Krakatoa, mean annual temperatures were 0.5 °C lower for the next three years. After eruption of Tambora, there were regional temperature drops of 1-5 °C. The year 1816 was called the year without a summer, there was famine in Europe and North America.

Both events were mild compared to the Toba eruption in Indonesia, which spewed forth an estimated 1000 km³ of ash. Luckily, this occurred about 75,000 years ago. But this information makes it clear how hazardous volcanoes are for our civilization.

Methods have been developed for predicting volcanic eruptions. Such methods include the monitoring of the gradient of a volcano's flanks and frequent trigonometric surveys to detect any tectonic movement; monitoring of seismic activity, as well as gravimetric and magnetic values. Gas analyses are also made. There is little else that can be done to protect lives or property from lava flows, lahars, or tsunamis.

THE RISK OF EROSION AND MASS MOVEMENTS IN MOUNTAINOUS AREAS

In mountainous areas, utilization of the land resources by man depends very much on geology, soils, topography, climatic conditions, and hydrogeological conditions. Erosion is one of the major natural factors threatening man's environment. Other risks are mass movements, for example, rockfalls, landslides, mudflows, and

avalanches. These phenomena may be triggered by heavy rainfall, rapid melting of snow, earthquakes, and human activities.

In the Himalaya for example, the continuous destruction of forests and the steady spread of built-up areas, as well as the spreading of agricultural land up to elevations of 4000 m, have changed the landscape considerably. Felling of trees and overgrazing have fostered erosion. With the exploitation of mineral resources and the beginning of mining activities, there has been additional demand for wood for mine timbering and charcoal for smelting ores, causing further destruction of the forests.

These developments were initiated by man settling in alpine regions. The first settlements were mostly established in areas above the flood levels of streams and rivers, either on rocky ground or on elevated talus fans. This involved being exposed to the risk of occasional rockfalls, landslides, and avalanches. The early settlers tried to protect themselves by planting trees, erecting dikes and digging drainage channels.

Industrialization, and particularly the establishment of an infrastructure, such as communication routes and dams, have had an increasingly severe impact on the environment. Human activities, both past and present, are directly and indirectly responsible for exacerbating erosion in mountainous areas, whose soils and climatic conditions facilitate erosion. In very early times, man used his resources in a rational way, taking measures to combat soil erosion and other erosional hazards such as landslides and floods. Evidence of terracing and stone walls that were constructed in an

attempt to control erosion of arable land can still be seen in mountainous regions. Similarly, there are areas of pasture which have been in continuous use for over 4000 years. The main causes of accelerated, widespread and irreversible erosion are, for example, farming in unsuitable areas, which are later abandoned, excessive felling of trees, overgrazing, periodic burning of scrub and undergrowth, and forest fires.

Growing risks of this kind have increased the rate of migration of the rural population to the towns. It is the responsibility of the geoscientist to recognize and assess not only the beneficial effects of man's activities, but also the detrimental effects, particularly in the long term. Remote-sensing data in combination with detailed ground checks can be used to produce maps showing areas vulnerable to erosion as well as natural hazard maps. Land use that is not compatible with the environment should be avoided or modified. Environmental protection measures should include reforestation programs in the first order. In these regions of highly diverse morphology, where access and communication are difficult, thorough consideration must be taken during regional planning of potential hazards to ensure that their short-term and long-term impact on man and the environment is kept as small as possible.

FLOODS

Coates (1981) lists the following natural causes that may lead to flooding:

- (i) heavy rains (e.g. from monsoons, typhoons, hurricanes);
- (ii) melting snow;

- (iii) ice-dams or barriers;
- (iv) landslides;
- (v) tsunamis and seiche.

Heavy rains especially affect lowlands and coastal areas. In such flat areas, floods can spread over wide areas beyond the river beds. In mountainous areas, however, a sudden thaw can often cause flooding. Frozen or water-saturated soils often represent a grave danger, since they have no storage capacity. Melt water may back up behind ice dams in periglacial areas during the summer, eventually leading to a rupture of the ice barrier and devastating floods e.g. the catastrophic glacial lake outburst of August 4, 1985, from the Dig Cho glacier in Nepal; (Nepal Geological Society and Association of Hydrologists of India). Landslides that block river valleys have a similar effect. Such natural dams are eventually eroded by the backed-up water, leading to a flood wave down the river valley.

According to the US Office of Chief Engineers (1976), the following measures can be employed to prevent or restrict inland flooding:

- a. appropriate landuse in catchment areas and flood plains of rivers;
- b. construction of dams and dikes;
- c. soil amelioration, especially with respect to the retention capacity of the soil;
- d. zones near rivers in urban areas should be kept free of buildings (e.g. parks) so that there is space for floods to spread out without causing too much damage and so that peak flood levels are lowered;
- e. warning systems.

Tsunamis are caused by earthquakes whose epicenter is located in the ocean crust. There are usually several waves; the first one is not necessarily the most devastating.

A flood wave entering an estuary is particularly dangerous, because the narrowing of the drowned river valley causes the water level to rise considerably; a similar phenomena, called a seiche, occurs in large lakes, either for the same reason or caused by wind or small earthquakes.

Storm tides often cause salinization of near-surface aquifers and thus are a danger to the drinking water supply. The extent of salinization can be delineated using geoelectrical methods (Frathe 1955). In addition to ground surveys, a helicopter-borne electromagnetic survey can be made to determine the location of the drinking water/saline water boundary (Sengpiel and Meiser 1981).

CONCLUSIONS

If environmental protection is to be effective, it must include an inventory and assessment of the natural resources of the area and the processes that have an impact on the environment. It must also include conversion of this knowledge into environmental planning and the management and protection of resources. The knowledge and methods of environmental geology are required for the success of ecological measures.

Environmental geology involves the study of the natural resources of the area in question, the impact of man's activities on the earth, as well as with the causes and

effects of earth processes. As described above, these natural processes may cause considerable pollution of and damage to the environment. Environmental geology makes use of the knowledge and methods of numerous other disciplines. Functioning as a geoscientific consultant and using methods specific to this field, environmental geology can provide preventive and rehabilitation measures, actively contributing to the protection of the environment, as well as furnishing a basis for planning the management of resources in a way that is compatible with the environment and promotes economic development.

The Geological Surveys have the necessary prerequisites to deal with complex environmental problems by qualified personnel working in an interdisciplinary team for an independent assessment and solution of these problems, also within the framework of Technical Cooperation and contributing to the International Decade for Natural Disaster Reduction (IDNDR).

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List of Publication of the Nepal Geological Society

1. Journal of Nepal Geological Society, Vol. 12, Special Issue, Aug. 1995
(Abstract Volume of First Nepal Geological Congress, Kathmandu, 1995)
2. Journal of Nepal Geological Society, Vol. 11, Special Issue, April 1995
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3. Journal of Nepal Geological Society, Vol. 10, Special Issue, April 1994
(Abstract Volume of 9th Himalaya-Karakorum-Tibet Workshop, Kathmandu, 1994)
4. Journal of Nepal Geological Society, Vol. 9, June 1993
5. Journal of Nepal Geological Society, Vol. 8, June 1992
6. Journal of Nepal Geological Society, Vol. 7, June 1991
7. Journal of Nepal Geological Society, Vol. 7, Special Issue, Feb. 1991
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15. Journal of Nepal Geological Society, Vol. 2, No.1, May 1981
16. Journal of Nepal Geological Society, Vol. 1, No.2, 1981*
17. Journal of Nepal Geological Society, Vol. 1, No.1, 1981*

Note: Issues with asterik (*) marks are out of prints. Photocopy of articles may be available upon payment of necessary fees. News Bulletin, Volume 1 to 12 had already been published and available free of cost. Journals can also be purchased by postal order and postal charge will be charged along with the price of journal. 50% discount is available for journals of vols. 1 to 8.

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नेपाल भौगर्भिक समाजले Association of Geoscientists for International Development (AGID), International Union of Geological Sciences (IUGS) and Geoscience Education and Training (COGEOT) को संयुक्त सहयोगमा सेप्टेम्बर १७, १९९५ देखि सेप्टेम्बर १९, १९९५ सम्म ३ दिने वैज्ञानिक लेखन कार्यशाला (Scientific Writing Workshop) तालिमको आयोजना काठमाडौंमा गरेको थियो । सो कार्यशाला श्रीलंकाका Prof. P. G. Cooray को संयोजकत्वमा संचालन भएको थियो ।

उक्त कार्यशालाको समापन समारोहमा नेपाल भौगर्भिक समाजका अध्यक्ष श्री कृष्ण बज्रादिकारले यस प्रकारको कार्यशाला नेपालमा पहिलो पटक आयोजना गरिएको र यसमा विभिन्न सरकारी विभाग, मन्त्रालयका साथै विश्वविद्यालय, कन्सल्टेन्सी फर्मस र ICIMOD जस्ता अन्तरराष्ट्रिय संस्थामा कार्यरत भूगर्भविद, इन्जिनियर, अनुसन्धानकर्ता, प्राध्यापक एवं व्यवस्थापकहरूको सहभागिता भएको भयो । यसै क्रममा उहाँले यस प्रकारको कार्यशालाबाट हाम्रा वैज्ञानिक लेखन शोधपत्र एवं प्राविधिक प्रतिवेदनहरू अन्तराष्ट्रिय स्तरमा तयार

गर्नमा धेरै सहयोग पुग्ने कुरा व्यक्त गर्नु भएको थियो । उक्त समारोहमा सहभागीहरूको तर्फबाट कार्यक्रममा नाथ उप्रेती र कन्सल्टेन्सी फर्महरूको तर्फबाट श्री गोकुल लाल अमात्यले उक्त कार्यशाला निकै प्रभावकारी भएको र सोबाट आफुहरूले उपयोगी ज्ञान हासिल गर्ने गरेको धन्यवाद ज्ञापन गर्नु भएको थियो ।

यस अघि उक्त कार्यशालाका संयोजक Prof. P. G. Cooray ले आफुले यस प्रकारको कार्यशाला विभिन्न देशमा संचालन गर्दै आएको र नेपालमा यो अन्तर्जातियै भागको कुरा भएको गर्दै यस कार्यशालाको सफलतापूर्वक सम्पन्न भइ राधा कुलफुल एवं पतिक्या भई कार्यशाला सफल भएकोमा आफु ज्यादा खुशि भएको कुरा व्यक्त गर्नु भयो ।

उक्त कार्यशाला समापन समारोहको अन्त्यमा प्रोफेसर्लाई Prof. P. G. Cooray ले प्रमाणपत्र वितरण गर्नुका साथै समाजका सचिव डा. राजेन्द्र बहादुर श्रेष्ठले वैज्ञानिक लेखन कार्यशालाका संयोजक Prof. P. G. Cooray तथा सहभागीहरू सवैलाई धन्यवाद ज्ञापन गर्नु भएको थियो ।

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INTERNATIONAL DECADE FOR NATURAL DISASTER REDUCTION (IDNDR DAY 1995)

October 11, 1995

Women and Children: Key to Prevention

National Meeting cum Seminar on

Prevention of Natural Disaster: Challenges to Scientific Communities in Nepal

The Nepal Geological Society organised a one-day National Meeting cum Seminar on "Prevention of Natural Disaster: Challenges to Scientific Communities in Nepal". The United Nations has declared the 1990-1999 decade as the International Decade for Natural Disaster Reduction. The Nepal Geological Society has responded to this UN declaration by organising one day national seminar every year and continuing this tradition the Society organized one day National Meeting cum Seminar on Oct. 11, 1995.

The seminar was chaired by Mr. Rewati Raman Pokharel, Secretary, Home Ministry. Mr. Pokharel addressed the inaugural function. Honourable Home Minister Mr. Khum Bahadur Khadka was the Chief Guest.

Dr. D.R. Kansakar, Vice-President, Nepal Geological Society delivered the welcome speech. The Chief Guest Honourable Minister Mr. Khadka also addressed the gathering during the inaugural session in the morning. Mr. A. M. Dixit, Coordinator, NGS-IDNDR Council also spoke highlighting the importance NGS has given to the IDNDR concept during the inaugural program. The session was also addressed by Mr. Larry Maramis, the Deputy

Resident Representative, UNDP, Kathmandu. Mr. Shyam P. Rimal, Director, Disaster Prevention Technical Centre also addressed the morning session. Dr. Jyoti Tuladhar, Executive Director of Centre for Women, Children and Community Development, Kathmandu emphasized the importance of Natural Disaster Awareness Education program to women particularly women and children of rural areas of Nepal and also preventive measures. Mr. Ramesh Kumar Sharma, Director of SOS Children's village, Sanathimi, Bhaktapur spoke on importance of educating children about natural disaster and its impact on children of Nepal. Dr. Rajendra B. Shrestha, Secretary of the Nepal Geological Society delivered the vote of thanks.

The inaugural session was followed by technical sessions during which various aspects related to Natural Disaster were discussed.

At the concluding session, resolution was adopted from the participants to be submitted to the policy and decision makers of His Majesty's Government of Nepal and related international organisations.

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**Welcome speech delivered by
Dr. D. R. Kansakar, Vice-President, Nepal Geological Society
during the National Meeting cum Seminar on
International Day For Natural Disaster Reduction (IDNDR-1995)
Kathmandu, Nepal**

Mr. Chairman,
The Chief Guest, Honorable Khum Bahadur Khadka, Home Minister and the Chairman IDNDR National Committee, Nepal,
Respected Secretaries of Ministries of HMG,
His Excellency Mr. Larry Maramis,
The Resident Representative, UNDP, Nepal,
Mr. R. Sugimoto, Chief Advisor, DPTC
Distinguished Guest,
Ladies and Gentlemen,
Fellow members of Nepal Geological Society.

It gives me great pleasure to welcome you on behalf of the Nepal Geological Society to this Inaugural Ceremony of the National Meeting cum Seminar on **Prevention of Natural Disaster: Challenges to Scientific Communities in Nepal** under the general theme proposed for this year **WOMEN AND CHILDREN: KEY TO PREVENTION**. I am grateful to our chief guest Honorable Home Minister Mr. Khum Bahadur Khadka for his presence with us and accepting our request to inaugurate the Seminar and deliver his inaugural speech.

As we all know IDNDR (1900 - 2000) was proclaimed in 1989 by the UN General Assembly to bring about a reduction in loss of life and damage to property resulting from natural disasters. We are now right in the middle of the UN proclaimed decade. The Nepal Geological Society has been organizing

this type of meetings and seminars to observe this very important International Day for Natural Disaster Reduction since 1991. Today's meeting is the fifth of this series. This is a common platform for geoscientists, engineers and peoples from various disciplines, representatives from various professional societies and NGOs to meet together and share their experiences on the needs of the preventive measures for various types of natural disasters frequently faced by the country.

The main objective of such meetings is to raise awareness among the people about various types of natural disasters and the possible ways of their prevention, mitigation, reduction of vulnerability and ultimately reduction in loss of life and damage to property.

The Nepal Geological Society gives great importance to the concept of IDNDR. As an active member of IDNDR National Committee of Nepal, it is assisting the national agencies in all possible ways. We were active in the preparation of the National Report presented in Yokohama Conference 1994 in Japan and our representative participated as a member of the National Delegation. Members of our Society are also contributing in the Environmental Protection Council. Members of the Society in various capacities have been actively cooperating with the government and

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other organizations in the tasks of National Development, Environmental Protection, Natural Disaster Reduction and Infrastructure Development and effective utilization of Water and Mineral resources etc. There are many more areas where we the geoscientists of Nepal wish to be involved.

In the last four IDNDR meetings we have discussed on Geological Hazards and Environmental Problems in Nepal, possible Geoscientific Inputs in Natural Disaster Management, and in Preparedness and Mitigation of Natural Disasters. The abstracts of the papers presented in those meetings and the main conclusions and resolutions of such meetings have been submitted to His Majesty's Government for action. They have also been published in different volumes of Bulletin of the Society for public use.

The Nepal Geological Society has completed its 15 years. At present it has a membership of 350 geoscientists from Nepal and from abroad. It has permanent regional focal points in Europe, America, Australia, Japan and the SAARC Region. Publication of the scientific Journal of Nepal Geological Society and the Bulletin of the Society and the organization of Seminars, Geological Congress, scientific Workshops and Talk Programs are the main regular activities of our Society. It has successfully organized National as well as International Seminars and Workshops in the past. For instance, last year we organized the international 9th Himalaya-Karakorum-Tibet workshop with participation of 250 scientists from 27 different countries and this year in August, we organised the First Nepal Geological Congress in Kathmandu to mark the 15th anniversary of our Society. In this

Congress over 200 participants from 10 different countries participated and discussed on various problems of Geology of the region.

Our country faces several kinds of natural disasters. Among these, Earthquakes, Landslides, Floods, Debris Flow, Glacier Lake Outburst Floods and Drought are the common ones. They are causing extensive damage to the national economy and are incurring heavy loss of life every year. So far the efforts in Nepal are mainly concentrated in post disaster activities such as relief, rescue, and rehabilitation in our disaster management. However, it is time that we stress on the pre-disaster preparedness and mitigation activities. Now, we know that it is possible to reduce the disaster but to make this a reality on the one hand, we have to make a wider section of our planners, managers, and decision makers aware about the benefits of disaster reduction and on the other hand we should ask our scientists and engineers to assess the hazards/risks and their distribution pattern in the country to better prepare ourselves for the necessary prevention/preparedness and mitigation programs and to implement them. We must understand that the effective reduction of disaster cannot be achieved without active and convincing participation of the common people and real sufferers at the village level. Therefore, it is essential to run massive public awareness raising programs. The Nepal Geological Society/IDNDR Council has recently prepared simple awareness raising leaflets for safety against earthquake and flood events for wider circulation at a primary school and VDC level all over the country. I am sure that the IDNDR National Committee will help in the publication and circulation of these leaflets.

The Nepal Geological Society wishes to express its thanks to IDNDR National Committee for giving support to organize this meeting in Kathmandu. We assure that the Society is ready to discharge the responsibilities given to it. We also acknowledge the continuous cooperation received from DPTC/JICA and the UNDP by providing partial funding to organize this meetings.

The first part of the programme is devoted mainly to the sharing of information and experiences on planning and execution of disaster prevention, reduction and mitigation

related activities undertaken by the different government and non-government organizations in Nepal. The second part will be devoted for the presentation and discussion on technical papers on the results of various investigations and researches carried out on hazard assessment, mitigation and preparedness.

We look forward to active discussions and fruitful conclusions.

I welcome you once again to express your ideas and findings in the following sessions.

Thank you very much for your kind attention.

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**Inaugural Address by
Honourable Home Minister Mr. Khum B. Khadka
to the IDNDR National Meeting cum Seminar, Oct. 11, 1995**

Mr. Chairman,
Ladies and Gentlemen.

It is a privilege for me to be invited to this important meeting organised to observe the International Day for Natural Disaster Reduction and given the responsibility to inaugurate it.

The Nepal Geological Society should be thanked for organising such meeting and the Seminar which is being participated in not only by geoscientists but also by the representatives from a cross section of the society. I am thankful to the organisers for observing the IDNDR Day in such a manner. I am extremely glad to note that the Nepal Geological Society has made it a tradition to observe this important IDNDR Day by organising scientific discussions on aspects of natural hazards faced by our country so as to identify the ways to reduce the natural disaster. Observance of this day in this fashion makes us belong to the international community because such meetings and activities are being carried out throughout the world today.

As is well known, Nepal faces several of the natural disasters. Our country lies in high seismicity zone and earthquakes are frequent. Similarly, the country faces recurrent problems of Landslides, Floods, Glacier Lake Outburst Floods, Debris Flows, Erosion, Cloud Burst and Cyclonic Storms, Droughts etc, which are of natural origin. Many of these natural phenomena can not be averted. There are also other disasters which stem out due largely to our own actions and our inability to

manage them. The consequences of the hazardous events have been disastrous. For years we were putting our efforts to provide relief to the victims of the disasters, and in rehabilitation activities. We found that the post-disaster works are expensive and many times beyond our limited resources. But not we have understood that prevention and mitigation activities are the most effective in reducing the disaster and in its proper management. This is also the central theme of the IDNDR concept.

His Majesty's Government of Nepal has realised this fact and gradually gearing the programs of its various agencies in this line. With the support from UNDP and other friendly countries and institutions, HMG has improved the institutional capabilities of the concerned agency in disaster management and provided training to national staff. Hazard mapping and assessment of the mitigative measures are being routinely implemented in many of the infrastructural projects. Efforts are being made to incorporate this principle of hazard assessment and incorporation of the mitigative measures right in the design itself.

The IDNDR National Committee has been expanded to incorporate representatives from the academic field and professional societies. The Committee has been active drafting the National Action Plan which has been streamlined to reflect the intent and recommendations of the Yokohama Declaration made on the occasion of the World Conference on Natural Disaster Reduction in 1994. His Majesty's Government will take all necessary measures towards

implementation of the proposed National Action Plan. The Government is committed to the IDNDR concept and will undertake all necessary action so as to achieve the overall goals of reducing the sufferings of the common Nepalese from the vagaries of the nature.

Luckily there has emerged a gradual consensus in Nepal that the enormous problems of disaster reduction can not be solved by the government alone. Academic and research institutions, corporate agencies and private sector, non-governmental organizations as well as professional institutions are actively supporting the governments' efforts and initiatives in this direction. We are also being supported generously by friendly countries and international institutions in our endeavour towards disaster reduction. The assistance provided by the Government of Japan in the establishment of DPTC is an example.

The responsibility of disaster reduction should be shared by all section of the society. Given the fact that a vast majority of the Nepalese population is unaware of the possibilities of disaster mitigation, the responsibilities of the leaders and leading professional societies acquires a still larger dimension.

This year's theme of IDNDR is "Women and Children - Key to Prevention". The theme very aptly identifies the targets to concentrate the focus of our attention and reminds of our obligation to reduce the sufferings by the disasters of the women and the children because they are not only the most suffered ones but they are also the ones who can be the most active in the long term implementation of the message of the IDNDR. Meetings and Seminars such as the present one help us in furthering unity in our understanding of the problems of natural disaster prevention and mitigation, in fostering the awareness

programs and in the identification of the priorities of action and in the formulation and implementation of the preventive and mitigative measures.

But the task lying ahead is immense. IDNDR has set concrete targets for the Decade which need to be achieved by the year 2000. These include comprehensive national assessments of risks from natural hazards and its integration in the national planning, preparation of national plans at national and/or local levels which should focus on the long-term prevention, preparedness and community awareness, facilitating development of warning system on global, national and local scale.

Fulfillment of such tasks calls for the involvement of professionals and agencies from the government, universities, professional societies and the public at large. This is a challenge to the scientific communities in Nepal. The government, acting as an initiator and facilitator, will provide assistance to achieve the required level of coordination of action.

There are many well-trained scientists and engineers in the country. It is necessary to mobilise the knowledge of these personnel in the implementation of the tasks. At the same time it is necessary to provide opportunities to the professional for access to information and knowledge acquired so that they are aware of the current knowledge worldwide in their respective fields.

I do hope that this meeting as well as the Seminar to follow will seriously discuss on these matters and come to a fruitful consensus regarding the necessary steps to be taken. The government will do its best to listen to the opinion of the scientists and implement the pertinent recommendations.

I thank the organizers again.

Vote of Thanks delivered by Dr. Rajendra B. Shrestha during the IDNDR National Meeting cum Seminar, Oct. 11, 1995

Mr. Chairman,
Chief Guest: Honorable Home Minister
Mr. Khum Bahadur Khadka,
Your Excellency Mr. Larry Maramis, Deputy
Resident Representative, UNDP, Nepal,
Respected Secretaries of different ministries of
HMG/Nepal,
Mr. R. Sugimoto, Chief Advisor,
DPTC/JICA,
Distinguished Guests and Participants,
Dear Fellow Members of the Society,
Ladies and Gentlemen.

On behalf of the Nepal Geological Society, I am very much delighted to welcome you all once again to today's National Meeting cum Seminar on *Prevention of Natural Disaster: Challenges to Scientific Communities in Nepal* under the general theme proposed by the United Nations for this year- *Women and Children: Key to Prevention*. The Nepal Geological Society had been organising such a day long National Meeting cum Seminar since the United Nations proclamation of the 90's decade as the INTERNATIONAL DECADE FOR NATURAL DISASTER REDUCTION (IDNDR). And continuing the Society's contribution to this natural disaster reduction program, the Nepal Geological Society is organising today's National Meeting cum Seminar this year also in close co-operation with other governmental and non-governmental organisations or agencies.

At this moment, the Society is highly encouraged by presence of Honorable Home

Minister Mr. Khum B. Khadka with us this morning. On behalf of the Nepal Geological Society, I would like to extend our sincere gratitude to Honorable Minister for sparing his valuable time today in inaugurating today's Meeting cum Seminar and for his inaugural address to this program.

The Society would also like to express its sincere gratitude to Mr. Rewati Raman Pokharel, Secretary, Home Ministry for presiding over the inaugural session as the Chairman and your notable address to this National Meeting cum Seminar.

The Society would also like to extend its sincere appreciation to His Excellency, Mr. Larry Maramis, Deputy Resident Representative of the United Nations for being with us this morning and your support.

The Society received strong co-operation from the IDNDR National Committee, Home Ministry, Nepal in the organisation of today's Meeting cum Seminar. The Nepal Geological Society extends its sincere thanks to the IDNDR National Committee, Nepal.

Collaborative support for the organization of today's Meeting cum Seminar has been provided by the Disaster Prevention Technical Center (DPTC). The Society would like to extend its sincere acknowledgement to Mr. Shyam Prasad Rimal, Director, Water Induced Disaster Prevention Technical Center, and Mr. R. Sugimoto, Chief Advisor, Disaster Prevention Technical Center (DPTC) for the

collaborative support extended to the Nepal Geological Society.

Sincere thanks are also due to Dr. Jyoti Tuladhar, Executive Director, Center for Women, Children and Community Development, Kathmandu and Mr. Ramesh Kumar Sharma, Director, SOS Children's Village, Sano Thimi for being with us this morning and your addresses to the inaugural session.

The Society would also wishes to express its gratitude to the high officials of His Majesty's Government of Nepal, distinguished guests, journalists and other distinguished personalities (for being with us today) for offering your valuable time in gracing this inaugural session.

The organization of today's Meeting cum Seminar has been made possible by presence of you all, distinguished participants and scientists, by providing contribution of your valuable papers. The Nepal Geological Society wishes to extend heartfelt thanks to all the distinguished participants and scientists.

Various governmental and non-governmental organizations and agencies helped the Society

by providing logistic support for the organisation of this Meeting cum Seminar. Sincere acknowledgement is due to the (IDNDR National Committee, Home Ministry, Nepal), Department of Mines & Geology (DMG), Petroleum Exploration Promotion Project, Ground Water Resources Development Project of Dept. of Irrigation, Nepal Electricity Development Center, Central Department of Geology, Tribhuvan University, Department of Geology, Tri-Chandra Campus, and Nepal Electricity Authority for various logistic support extended to the Society.

Great deal of thanks to all the members of the Nepal Geological Society for their cooperation and support in one way or the other in the organisation of today's Meeting cum Seminar.

Last but not least, our sincere thanks to the Agriculture Project Services Center (APROSC), for providing this venue for today's meeting.

For any shortcomings or inconveniences incurred during this Meeting cum Seminar, we offer our sincere apologies.

Once again, thank you, thank you all.

**Abstract of Papers Presented
at
NATIONAL MEETING CUM SEMINAR
on
INTERNATIONAL DAY FOR NATURAL DISASTER REDUCTION
(IDNDR)**

**Organised by
NEPAL GEOLOGICAL SOCIETY
October 11, 1995
Kathmandu, Nepal**

**CURRENT TRENDS OF ENVIRONMENTAL DEGRADATION IN
KATHMANDU VALLEY : SIGNAL TO NATURAL DISASTER**

Toran Sharma
NESS (P) Ltd.
Thapathali-11
Kathmandu, Nepal

Kathmandu Valley is undergoing through a phase of rapid urbanization and industrialization. The pressure exerted by the growing population and industrial activities on the finite biophysical resources has already surpassed the carrying capacity.

There is already an alarming environmental degradation within the valley perimeter. Dense forest cover of the surrounding hill slopes, providing shelter to a number of wild flora and fauna, have depleted exposing deeply weathered rock formations for subsequent land degradation processes endangering the delicate ecological systems. Precious water springs, the life line of healthy environment, are gradually

drying. Abstraction of the available surface and underground water resource, for urban, industrial and intensive agriculture use, has adverse implications on the river hydrology down stream. The holy "Jal" considered to posses immortal power, no longer flows from the rivers now. Jal is replaced by filthy sewage and sullage of urban areas and chemically contaminated industrial and agricultural effluents. The life supporting rivers, have become the sites of breeding ground for life taking disease vectors.

Once productive agricultural fields are replaced by unplanned ugly concrete jungles and industrial establishments. There is no open

space to breath fresh air. Ill maintained dusty narrow roads littered with municipal, industrial and constructional wastes are crowded by ever puffing vehicular traffics. Industrial emissions and unmindful burning of solid wastes in the street corridors together have contaminated the air resource with toxic dusts and gasses. Surrounding mountains are no longer visible and seems to have been lost on the noisy atmosphere.

The implications of these deteriorating environmental conditions, through gradual, are eating up valley's scenic beauty, archeological

significance, touristic importance, ecological balance and above all human health and hygiene.

Current trends of valley development testify further deterioration of the valley environments. If it is to proceed unabated valleys natural resources, land, water air and all the dependent living systems, will be locked to a dead end. This will lead us to a great natural disaster beyond our imagination. The need of the hour is to check the hostile affects on the valley's finite resources and balance the growth for sustainable development.

ROLE AND EFFORTS OF THE DEPARTMENT OF SOIL CONSERVATION IN NATURAL DISASTER PREVENTION

Keshar M. Sthapit and Madhukar Upadhya
Dept. of Soil Conservation and Watershed Management
Kathmandu, Nepal

Earthquakes, floods and landslides are the major disaster (sudden or great misfortune) caused by natural phenomena commonly observed in Nepal. Earthquake of 1988 and floods and landslides of 1993 are vivid natural disasters that most Nepalese have observed on the land for their subsistence living is increasing the damage caused by the floods and landslides.

Upon understanding these critical problems in the fragile mountain eco-system of the country, the Department of soil conservation carry out different soil conservation and watershed management programmes namely: Land use planning, Land productivity conservation, Development infrastructure protection, Natural hazard prevention, Community soil

conservation extension and Income generation. Natural hazard prevention programme is intended for control of landslides, torrents and flash floods in order to protect life and property of the people. Gully treatment, landslide treatment, torrent control, stream bank protection and degraded land rehabilitation activities using various engineering and vegetative measures may be required. Check dams, retainingwalls, diversion channels, grass sowing, tree planting, are the main types of works under these activities.

So far 517 gullies, 222 number of landslides and 127 number of torrent control had been carried out since 1971 under the department. similarly 25 kilometres of stream bank

protection and 7671 hectares of degraded land rehabilitation had been carried out. There are many success stories such as Landslide Treatments: Labok at Ilam, Bhattedanda at Lalitpur, Degraded Land Rehabilitation: Sarbang Burrow Pit, Kulekhani and Pereni Conservation Area, Dang, and Gully Treatments: Bhardeo, Lalitpur and Kunchhal, Kulekhani. The success to the efforts are based on the integrated approach of treatment which includes management of water, bio-

engineering techniques and involvement of the people.

In the fragile mountain eco-system like in Nepal, every efforts to mitigate the natural disaster in order to uplift the economy of the people and the country should be made. The technical package of bio-engineering for the gully and landslide treatment need to be improved through integration of geological and hydrological knowledge.

NATURAL HAZARD REDUCTION IN NEPAL: NEED FOR ACTION

B. N. Upreti

Department of Geology, Tri-Chandra Campus
Tribhuvan University, Ghantaghar, Kathmandu

Nepal is a country highly prone to natural disasters like earthquakes, floods (including glacial lake outburst floods), landslides and debris flows. The Himalyan belt lies in a zone of high seismicity with frequent earthquake occurrences. Nepal has suffered several times due to large earthquakes in recent history. The earthquake of 1934, 1980 and 1988 are the last three big earthquakes to hit Nepal which killed a large number of people and brought severe economic hardship to the country. The country will undoubtedly suffer from such disasters in the future, perhaps in near future, with much more severe impacts.

The 1988 earthquake in Nepal brought for the first time some serious concern among the International agencies and Nepalese policy makers, and as a consequence a

project was formulated and executed on the seismic hazard mapping and risk assessment for Nepal. It was a comprehensive work and good start towards reducing one of the common natural hazards in Nepal. However, a great deal of knowledge on the seismicity of the country and the surrounding region is necessary to bring better results. Subject to the available basic data, a building code for Nepal has been formulated. It is to be seen how these codes will be strictly implemented. Nepal's first ever seismic station was established in 1978 and recently the National Seismological Network has expanded to 17 stations covering the entire country. In the coming years, it will provide invaluable database and information required for the seismic hazard zonation and disaster mitigation. Study of seismicity of a country is a long

term and continuous process and is as essential as recording hydro-meteorological data. Nepal being a earthquake prone country must give continued support and priority to this field of basic research.

Floods, especially in the Terai region of Nepal are frequent but the disaster that occurred in July 1993 in Siraha and Rautahat districts was unprecedented in terms of the loss of life and property. To many, it was more of a consequence of the faulty design of Bagmati Barrage that brought this natural disaster to such a great dimension. It has raised serious questions: Are these kinds of barrages for irrigation at the foot-hills of the Himalayas are really safe and do not become the death traps for the people living down streams? Are the designs appropriate to suit the geological and hydrological environments of the region? Have we thought of alternatives to such structures for irrigation? Definitely these are the questions which must be seriously evaluated at the present time by the concerned experts and planners.

GLOF, though a less frequent phenomenon in the country, is a natural disaster which brings a great devastation along its course and the life and property at risk is very large. The very costly infrastructures like dams for hydropower and roads have suffered many times from the GLOF and will continue to suffer if adequate studies and management of glacial lakes upstream are not done.

Landslide hazards are what the hill people of Nepal are most familiar with. They are widespread in this fragile Himalayan terrains and, more people suffer from the landslides than from any other natural hazards. A great

number of villages of Nepal are situated either on the old landslides or on the landslide prone areas. Every monsoon triggers numerous large and small landslides all over the hills and kill many people. Many smaller landslide disasters go unreported when they occur in remote areas. More than that, the losses of productive land in the hills during each rainy season that are seldom reported unless involves loss of life, seems to be so great that the economic loss if quantified will be no less than any other big natural disasters. Some studies have shown that the man-days the farmers put to repair their damaged farm due to landslides each year is staggering. Damage to infrastructures involving very large investment like roads, bridges, dams, hydropower stations, canals, buildings have suffered repeatedly due to landslides and floods. Due to the rapid population increase, since the last two or three decades people are forced to live in more hazardous areas than any time before. The scale of disaster in terms of number of lives and value of property involved is ever increasing.

Though the people of Nepal are suffering from the landslides at such a large scale, as yet no concerted efforts are put to mitigate the landslide hazards. Preparation of Landslide Hazard Maps are the first step in mitigating these disasters. Despite the fact that there are a number of governmental organizations, trained manpower and expertise, and accessible technology, Nepal has not started systematic landslide hazard mapping and produced hazard maps covering sizable area. There are a number of government organizations involved in the study of landslides and related phenomena but much is desired for coordination among them and country's limited resources are being spent in unplanned and duplicate works.

The IDNDR National committee in April 1994 formed a core group to prepare a Preliminary National Action Plan on disaster preparedness. The group proposed prioritywise action plan including cost estimates and time frame on earthquake hazard assessment, landslide hazard mapping and hydrologic and meteorologic related hazard studies (e.g preparation of flood hazard maps). However, so far practically no action has been taken on these action plans. Therefore, to

reduce natural disasters in a long term basis systematic studies and a great deal of research are necessary which take not months but years and decades. International Decade for Natural Disaster Reduction is being observed to focus on these issues and initiate and strengthen programmes on mitigating the effects of the natural disasters. Nepal can no longer afford to loose time in going for action on the reduction of natural hazards.

INTERSEISMIC STRAIN ACCUMULATION ON THE HIMALAYAN CRUSTAL RAMP, NEPAL

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The Department of Mines and Geology has been monitoring the seismicity of the Central Himalayas of Nepal since 1985. Intense microseismicity and frequent medium-size earthquakes ($m < 4$) tend to cluster beneath the topographic front of the Higher Himalaya. This 10-20km deep seismicity also correlates with a zone of localized uplift that has been evidenced from geodetic data. Both microseismic and geodetic data indicate strain accumulation on a mid-crustal ramp that has

been previously inferred from geological and geophysical evidence. This ramp connects a flat decollement under the Lesser and Sub-Himalaya with a deeper decollement under the Higher Himalaya, and probably acts as a geometric asperity where strain and stress build up during the interseismic period. The large Himalayan earthquakes could nucleate there and probably activate the whole flat-and-ramp system up to the blind thrusts of the Sub-Himalaya.

EROSION CONDITION ON LATERITE SOIL AREA: CASE STUDY OF PIPALTAR, TRISHULI

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Laterite areas are spreading on middle region of Nepal. Such areas have suffered with the problem of sheet erosion/gully erosion. Specially gully development is serious for cultivated land, road and building.

DPTC is observing gully expansion and sheet erosion in Pipaltar, Trishuli. Some kinds of countermeasures against gully erosion applied in the study area.



LOW COST MONITORING METHOD FOR LANDSLIDE

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The topography of Nepal varies dramatically from low lying areas of the Gangetic plain with an altitude of less than 100 m in the south and the higher Himalays with an altitude of more than 8000m, in the north within the very short horizontal distance of 90-120km. Under the physical conditions like rapid population growth, poverty, lack of education, deforestation and intensive agricultural practices, the vulnerability of the area has been increased due to slope instability specially in the form of landslide hazards. The fragile geology due to the tectonic reason along hill slope and intensive rainfall during every monsoon season enhance the problems still more. Landslide has affected most of the development infrastructures of the country in hilly region.

Not only in Nepal but most of the developing countries face the similar landslide problems each year and has to spend huge amount of national budget to combat against the landslide hazards. Although the hazard is well known, monitoring of the landslide and design appropriate counter measures are not being carried out due to lack of specific knowledge and high cost. Realizing these aspects in Nepal, Water Induced Disaster Prevention Technical Centre (DPTC) was established to strengthen the capability of technical personnel to cope with disasters and has been conducting study and research works at several landslide zones of Nepal. Four landslide model sites have been selected in various zones of Nepal from west to east to carry out detailed investigation and propose appropriate preventive measures.

Considering the importance of understanding the condition of the landslide for the establishment of appropriate prevention works, monitoring of surface and subsurface displacement, surface and ground water and topography and geology are being continued in all model sites using various types of equipment. To suit for the developing countries like Nepal, various types of low cost monitoring devices have been introduced together with expensive modern landslide monitoring devices and results are being studied. Due to the lack of awareness to all public about the importance of such monitoring devices, the equipment sometimes used to be disturbed by the local inhabitants which effects seriously in the output of monitoring data and sometimes it seems difficult for developing countries to provide with these expensive and special monitoring devices. Therefore, development of monitoring methods which are of low cost, simple and

reliable are taken in consideration. "Moving peg" and "Simple extensometer" methods which are applied in three model sites in order to observe surface displacement and its results are being introduced in this paper. It is observed that both of those methods are expected to be quite useful for understanding the condition of the landslide in developing country like Nepal. The Centre is hopeful to prepare "Low Cost Monitoring Manual for Landslide" in future.

The appropriateness of such low cost monitoring methods for landslide are being circulated to various levels of the government offices and public through trainings, seminars, posters and pamphlets, reports and specially launched programmes like roving seminars. This paper is expected to be useful in sharing the ideas of low cost monitoring techniques for landslides among the participating countries.

COMPOSITION OF SOLID WASTE OF KATHMANDU

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Solid waste is a visual pollutant with important implication for public health and environment. Waste of urban areas, industrial areas and hospital of Kathmandu was chosen for the study of composition. Physical composition, bacterial composition and heavy metals content were carried out during the study.

In urban areas, biodegradable substances obtained were from 76.5% to 82.5% in the winter season, and 80.5% to 84% during the

summer season. In urban areas, non-biodegradable substances were found to be 17.5% to 23.5% in the winter season and 16.0% to 21.5% during the summer season. High number of pathogenic bacteria were isolated from the solid waste of different areas in winter as well as summer seasons.

Quantitative determination of chromium varies from 7.06% to 226 mg/lit from shoe factory. Similarly cadmium was also obtained from leather and dying industrial wastes.

PROBABLE FLOOD PRONE REGIONS IN NEPAL

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Minimum ten years of daily data for 230 stations to analyze annual mean number of precipitation days >40 mm and >50 mm and similarly daily data for 264 stations have been used to analyze 24 hour extreme precipitation analysis to identify the flood prone regions in Nepal.

Precipitation amount and distribution during monsoon season show large fluctuations even within a short areal distance. High values of either intensity or depth may cause disaster, if one cause flood, the another causes landslide depending upon the scale of infiltration rate and physiography of the place. Because of the physiographic orientation of the country and monsoon characteristics i.e. its extension, speed and direction, considerable variation in precipitation is observed from place to place

resulting in some places heavy flood and in another places drought. The whole of the Terai region is susceptible to flood. Generally flood originates in the upstream and as it emerges out from the hills it extends the vast areal coverage in the plane area of the Terai. Flood prone zone extends more to the north in Central and Western regions. The large area of Terai is prone to probable flood, as we know that floods are along the rivers and its periphery. The areal coverage supports to intensify the flood magnitude. 24 hour extreme precipitation analysis also supports the areal coverage of the probable flood prone regions in Nepal. 24 hour extreme precipitation analysis shows more flood rivers and they are Karnali, Babai, Tinau, Narayani, Bagmati, Kamala, Sapta Koshi, Kankai and Mechi rivers.

RIVER BED LEVEL LOWERING AND ITS IMPACT TO THE INFRASTRUCTURES AND ENVIRONMENT OF KATHMANDU

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Bagmati, Bishnumati, Dhobikhola and Manohara, the major rivers of the Kathmandu Valley, originate from the north and north-east of the Kathmandu Valley. These river channels have been the site for sand quarrying since Kathmandu began to grow as a modern city. At present, bed level in these rivers has been lowered by 6-8 m. This has created a major problem regarding the safety of infrastructures such as bridges and ghats. The recent example of adverse effect of lowering of river bed is the tilting of one of the piers of Bagmati bridge at

Thapathali in 1991. Failure of the rural irrigation canals and an increased mass wasting events are other remarkable adverse effects of river bed lowering. Almost all bridges in these rivers have been provided with check dams. And also a huge amount of bank protection works have been done in the vicinity of these bridges. Quarrying of sand is not only a single cause of worsening the situation upto the present level but also important are manner in which it has been quarried and the way check dams have been designed and constructed.

नेपालको परिपेक्षमा वातावरण र विकास

किरण कार्की

खानी तथा भूगर्भ विभाग

परिचय:

वातावरण मानिसको जन्म देखि मरणसम्म सधैं संगै जोडिएको अभिन्न वस्तु हो । मानिस जन्मन्छ वातावरणमा असर पर्छ, मानिस विमार हुन्छ वा मृत्यु वातावरणमा असर पर्छ वा वातावरणका कारण मात्र पनि हुन सक्छ ।

वातावरण दुई प्रकारले प्रदुषित हुन्छ

(क) प्राकृतिक वा दैविक प्रकोपबाट

(ख) मानिसबाट गरिने प्रकोपबाट

प्राकृतिक वा दैविक प्रकोप पनि धेरै मात्रामा मानिस कै कारणबाट हुन्छ । भूक्षय, बाढी, पैठो इत्यादि सरसरती हेर्दा प्राकृतिक प्रकोप भएता पनि यी हुनुमा मानिसकै काम मात्र पनि हुन सक्छ । त्यसकारण यो संसारमा मानिसमात्र यस्तो वस्तु हो जसले वातावरणलाई विगान्न वा सपार्न सक्छ । वातावरण सपार्नु चाही ज्यादै सकारात्मक पक्ष भएता पनि त्यहि वातावरण सपार्न अर्को वातावरण विगान्नु पर्ने पनि हुन्छ । तर उन्नति वा विकासका लागि गरीने कार्यहरूमा केही वातावरण विग्रिए तापनि यसलाई सकारात्मक पक्षमा नै लिनु पर्दछ ।

विकास र वातावरण

वातावरण विग्रिएको वा सपिएको भनि लेखाजोखा गर्न हामीलाई सायद तुलोको जरुरत नपर्ला तर पनि केही टेक्नीकबाट चिन्तन गर्नु चाही अति आवश्यक छ र कति सम्म विग्रि पनि त्यसले कति सम्म सकारात्मक असर पर्छ भनि लेखाजोखा गर्नु पर्दछ । उदाहरणको लागि खानी उत्खनन गर्दा वातावरण विग्रन्छ तर वातावरण मात्र विग्रन्छ भनि उत्खनन रोक्नु पनि भएन वा छिटो छिटो विकास गर्छु भनि वातावरणलाई तहस नहस पनि पार्नु भएन वह उत्खनन क्षेत्रको भू-वनावट हेरी

कार्य गर्ने र उत्खनन सकिएका ठाउँहरूमा पुनः माटो भर्ने, वृक्षारोपण गर्ने जस्ता कार्य गर्नु पर्दछ ।

हालको परिपेक्षमा नेपाल, वातावरण र विकास

हाल नेपालको परिपेक्षमा वातावरण कता कता फेसनको रूपमा देखा परि मागीखाने र ठगी खाने भाँडो त भएको छैन ? समाजका शिक्षित वर्गले विभिन्न वाहाना बनाई डोनरसंग लिएर डलर ठगी खाने Tools त कतै बनाएका छैनन् ? उदाहरणको लागि केमिकल वातावरण विशेषज्ञले भू-क्षय हेर्ने, जल प्रदुषण विशेषज्ञले भूकम्प सम्बन्धी हेर्ने र कानून तथा प्रशासन तर्फका व्यक्तिले Solid Waste Environment अध्ययन गर्ने तथा सम्बन्धित विशेषज्ञ चाही तालु समाती बस्ने ।

नेपालको भू-वनावट, स्वरूप र प्राकृतिक श्रोत हेरी देशलाई सुहाउने वातावरण मापदण्ड बनाउनुको अलावा हामी जापन, अमेरिका वा युरोपेली देशहरूको मापदण्ड दुरुस्त उतारी विभिन्न पाँच तारे होटलहरूमा Workshop/Seminar गर्छौं र तयार भएपछि त्यो "कुकुरको शरीरमा विरालोको पुच्छर" जस्तो हुन्छ । जसको कारण डोनर्स ठिक्क, Policy Makers छिक्क, सम्बन्धित विशेषज्ञ दिक्क, Consultants दइ र विकास चाही भइ हुन्छ ।

अतः आफ्नो देशको स्वरूप, परिस्थिती र श्रोताहरूलाई समेत विचार गरि विभिन्न सेक्टरहरूलाई समेटेर मापदण्डहरू बनाउनु पर्दछ जस्मा Politicians को Commitment, Policy Makers को सही निर्णय र विशेषज्ञहरूको Ethics भएमा वातावरण-वातावरणको लागि मात्र नभएर वातावरण दिगो विकासको लागि हुन जानेछ ।

११ अक्टोबर १९९५ का दिन IDNDR DAY-1995 मनाउन आयोजना गरिएको
**PREVENTION OF NATURAL DISASTERS : CHALLENGES TO
 SCIENTIFIC COMMUNITIES IN NEPAL**

विषयक भेला एवं सेमिनार कार्यक्रमद्वारा पारित प्रस्ताव

यो सभा IDNDR DAY '95 का दिन निम्न
 प्रस्तावहरू पारित गर्दछः

१. IDNDR DAY '94 को सभाले पारीत
 गरेका सम्पूर्ण प्रस्तावहरूलाई कार्यान्वयन
 गर्न सम्बन्धित निकायहरू समक्ष पुनः
 अनुरोध गर्दछ ।
२. श्री ५ को सरकारद्वारा प्राकृतिक प्रकोप
 न्यूनिकरण सम्बन्धि अपनाइएका राष्ट्रिय
 कार्यक्रमहरू प्रति उत्साहित हुदै प्राकृतिक
 प्रकोप न्यूनिकरणका लागि IDNDR
 NATIONAL COMMITTEE द्वारा तर्जुमा
 गरिएको NATIONAL ACTION PLAN
 लाई यथाशीघ्र लागु गर्न श्री ५ को
 सरकार समक्ष अनुरोध गर्दछ ।
३. मुलुकको लागि तर्जुमा गरिएको राष्ट्रिय
 निर्माण संहिता लागु गर्ने तर्फ आवश्यक
 कारवाहीकालागि श्री ५ को सरकार समक्ष
 अनुरोध गर्दछ ।
४. प्राकृतिक प्रकोपको संदर्भमा महिला क्षेत्र
 अति पीडित हुने मात्र होइन, यथार्थमा
 महिलाहरूले आफ्नो क्याकलापद्वारा प्रत्यक्ष
 वा परोक्षतः पर्यावरण संरक्षण तथा
 प्राकृतिक प्रकोप निवारणका साथै प्रकोप
 पछिको सामान्यीकरण प्रकृयामा अती
 महत्वपूर्ण योगदान गर्दै आएका छन् ।
 तसर्थ प्राकृतिक प्रकोप न्यूनिकरणका
 सम्पूर्ण राष्ट्रिय प्रयासहरूमा महिलावृन्दको
 गहनतम योगदानको समुचित उपयोग

गर्नकालागि उनीहरूको व्यापक सहभागिता
 गराइनु पर्छ ।

५. प्राकृतिक प्रकोपले बालबालिकाहरूमा अती
 तीव्र असर पार्दछ । उनीहरूलाई प्राकृतिक
 प्रकोपबाट बचाई सुखमय बाल्यकाल प्रदान
 गर्नु समाजको दायीत्व हो । बालबालिकाहरू
 मुलुकका लागि अति महत्वपूर्ण सम्पति
 हुन । उनीहरूलाई प्राकृतिक प्रकोप असर
 न्यूनिकरण सम्बन्धि जानकारी विद्यालय
 मार्फत दिएर समाजले दीर्घकालिक उपलब्धि
 प्राप्त गर्न सक्दछ । प्राकृतिक प्रकोप
 न्यूनिकरण तर्फ गरिने राष्ट्रिय चेष्टामा यस
 प्रकारका कार्यक्रममा यथाचित जोड दिनु
 आवश्यक छ ।
६. नेपालमा प्राकृतिक प्रकोप न्यूनिकरणका
 लागि अती आवश्यक HAZARD
 MAPPING तथा RISK ASSESSMENT
 सम्बन्धि कामहरू गर्न सक्ने तथा उत्पाद
 न्यूनिकरणका उपायहरू पत्तो लगाई तिनको
 कार्यान्वयन गर्न सक्ने क्षमता आधारभूत
 रूपमा विकसित भै सकेको छ । तर ज्ञान,
 सीपको समुचित उपयोग तथा उपलब्ध
 जनशक्तिको उपयुक्त परीचालनको क्षेत्रमा
 निकै धेरै सुधारको आवश्यकता देखिन्छ ।
 यस तर्फ आवश्यक ध्यान दिई मुलुकमै
 उपलब्ध वैज्ञानिक तथा प्राविधिज्ञहरूको
 उचित उपयोग गर्नका लागि सम्बन्धित
 सम्पूर्ण निकायहरूमा अनुरोध गरिन्छ ।

Participation in Seminars, Conferences and Workshops

Following members of the Nepal Geological Society participated in various seminars, conferences and workshops in different countries during the period of March 1995 to February 1996:

Topic	Participants	Duration/Country
AAPG Annual Convention	Bashyal, R.P.	March 5-8, 1995 Houston, U.S.A.
1st Meeting of the Working Party of Senior Geologists	Joshi, P.R.	30 May-15 June, 1995 Bangkok, Thailand
10th Himalaya-Karakorum-Tibet Workshop	Kaphle, K.P.	4-8 April, 1994 Switzerland
International Workshop on Water Resources Management	Kunwor, M.B.	Feb 28-March 27, 1996 Tel Aviv, Israel
Construction Materials	Maharjan, S.R.	Sept. 25-Oct. 31, 1995 Germany
AAPG Annual Convention	Shrestha, R.B.	March 5-8, 1995 Houston, U.S.A.
Workshop cum Training Course on Environmental and Urban Geology of Fast Growing cities	Tuladhar, G.B.	June 20-28, 1995 Shanghai, China

CONGRATULATION

The Nepal Geological Society extends its congratulation to Mr. Gopal Singh Thapa, Life-Member of the Nepal Geological Society, on being appointed as the Director General of the Department of Mines and Geology, Ministry of Industry, HMG/N, Lainchour, Kathmandu, Nepal on Nov. 26, 1995 (B.S. Marg 10, 2052).

HAPPINESS

The Nepal Geological Society expresses its happiness on reinstatement of following members of the Nepal Geological Society to their respective job positions in different organizations of His Majesty's Government of Nepal:

- 1.Mr. Jageshwor Jha
- 2.Mr. N. D. Maskey
- 3.Mr. S. B. Shrestha
- 4.Mr. S. M. Shrestha
- 5.Mr. R. N. Yadav

Best Wishes and
Hearty Felicitations

on

the Auspicious Occasion

of

46th National Democracy Day

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Completion of Master/Diploma/Training Programs

The Nepal Geological Society extends hearty congratulations to the following members who have completed advanced studies and training courses in geological sciences in different countries and wishes them success in their professional career.

Topic	Participants	Duration/Country
Remote Sensing	Adhikari, P.C.	April, 1995 Sweden
Engineering Geology	Bhattarai, T.N.	April, 1995 Japan
Engineering Geology	Dongol, V.	June, 1995 Japan
Construction Materials	Ghimire, H.N.	Sept. 25-Oct.31,1995 Germany
Engineering Geology	Humagai, I.R.	April, 1995 German
PG Diploma in Engineering Geology	Kayastha, B.P.	Aug.1994-July 1995 The Netherlands
Engineering Geology	Koirala, Achyut	Sept. 25-Nov. 5, 1995 Germany
Hydro Power Development	Lacoul, Sriranjana	Sept.9 - Nov. 3,1995 Sweden
Construction Materials	Maharjan, S.R.	Sept. 25-Oct. 31,1995 Germany
Training on use of ERDAS IMAGINE ver. 8	Mool, P.K.	Jan.-Feb., 1995 Tokyo, Japan
Petroleum Policy and Management	Poudyal, K.R.	Aug.-Sept., 1995 Norway
Petrology	Poudyal, L.P.	May 1995, Japan
Engineering Geology	Shrestha, O.M.	Sept. 25-Nov. 5, 1995 Germany
PG Training Course on Ground Water Tracer Techniques	Tater, P.S.	Aug.15-Sept. 22, 1995 Graz, Austria

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Obituary

Madhu Sudan Raj Hada (1951-1996)



Madhu Sudan Raj Hada died on February 5, 1996 (B.S. 2052/10/22) after suffering from an illness for a while.

Madhu Sudan Raj Hada was born on February 17, 1951 in Bhaktapur. Late Hada had obtained B.Sc. in Geology from Tri-Chandra College, Kathmandu in 1970, M.Sc. in Applied Geology from Nagpur University, India, in 1973 and M.Sc. in Hydrogeology from London University, University College London, in 1982. Late Hada had also received various other trainings in Mineral Exploration, Investigation and Geological Mapping Works of Hydropower Projects.



Late Hada had made geological contribution in the development of Kulekhani Hydroelectric Project from 1973 to 1975. He had made significant contribution in geological investigation works for Devighat Hydroelectric Project, Seti Hydroelectric Project, Kali Gandaki Hydroelectric Project, Marsyangdi Hydroelectric Project, Arun Hydroelectric Project, Seti Hydroelectric Project (West), Pancheshwar Hydroelectric Project and Karnali Hydroelectric Project from 1975 to 1990. He was a Project Incharge for Kailali Kanchanpur Tubewell Irrigation Project (Dhangadhi) and Counter Part Geologist for JICA for the Ground Water Investigation Works at Jhapa District from 1990 to 1993.

Late Hada had made significant contribution towards the development of the Nepal Geological Society since its establishment. He was a life member of the Nepal Geological Society and had been elected Treasurer of the Nepal Geological Society during 1980-1982.

The Nepal Geological Society expresses its deepest sorrow at the sad demise of Madhu Sudan Raj Hada.



Internet Mailing List Announcement

HimNet - Himalayan Researchers List

E-Mail Address:	HimNet@erdw.ethz.ch
Description:	HimNet (Himalayan Network) is a E-Mail Internet link for any researcher working in the Himalayan countries of Pakistan, India, Tibet (China), Nepal and Bhutan. A news/discussion digest is sent to all those who are subscribed. HimNet is a "moderated" mailing list and aims to provide: conference details, list of latest Himalayan papers published in scientific journals, Himalayan magazine announcements, job vacancies with Himalayan interest, news from the Himalayan regions, scientific research information and news about anything related to the Himalayas.
Access:	If you want to subscribe to the HimNet Mailing List, send an E-Mail to: HimNet@erdw.ethz.ch with the command: SUBSCRIBE <Your Name>
Coordinator:	Dr. David A. Spencer Geologisches Institut ETH-Zentrum, CH-8092 Zürich SWITZERLAND Telephone : +41-1-632-3698 Telefax : +41-1-632-1080 E-Mail : DAspencer@erdw.ethz.ch

International Seminar on Water Induced Disaster (ISWID-1996)

NOTICE

International Seminar on Water Induced Disaster-1996 is to be held in Kathmandu, Nepal from November 26 to 29, 1996. This will cover a wider range of subjects on Water Induced Disasters. The emphasis will be given on Appropriate Technology, Policy and Planning on disaster management, People's participation, Bio-engineering for erosion & sedimentation problems and Development of risk analysis method.

Correspondence Address:

Mr. B. G. Rajkarnikar
Chairman, Executive Committee,
ISWID-96
Water Induced Disaster Prevention
Technical Center,
Pulchowk, Lalitpur, Nepal.
Tel.: 977-1-535-407, 535-502~3
Fax: 977-1-523-528

2nd International Seminar & Exhibition on Geophysics Beyond 2000

NOTICE

Association of Exploration Geophysicists, Hyderabad, India is organising two workshops on (1) Seismology and tectonics of peninsular India and (2) Airborne geophysics on 15 and 16 November, 1996 and three training courses on "Ground Water and environmental studies", "Mineral exploration" and "Basin modeling" from 1 to 15 November 1996. For details please contact:

Dr. Y. Sreedhar Murthy

Secretary

Association of Exploration Geophysicists

CEG Building, Osmania University

Hyderabad - 500 007, India

Tel. : 91-40-7019001, 671383

Fax : 91-40-7019001

E-Mail : AEG@AMCCS.UUNET.In

Information Circular is also available at the

Nepal Geological Society Office, Kathmandu.

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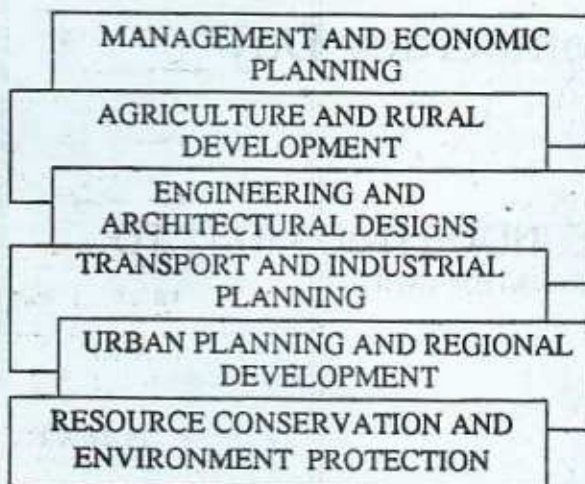
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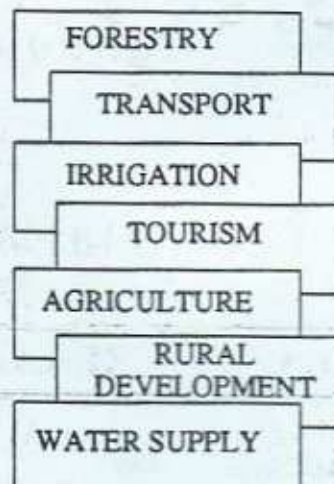
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